

Assessment of the Development of Agricultural Initiatives for USAID/Yemen

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ACRONYMS

A21A	Agenda for 21st Century Agriculture
ACU	Agricultural Cooperative Union
AFPPF	Agricultural and Fisheries Production Promotion Fund
AREA	Agricultural Research and Extension Authority
ASC	Agriculture Services Corporation
CACB	Cooperative and Agricultural Credit Bank
CGIAR	Consortium for International Agricultural Research
DOI	Directorate of Irrigation
ERADA	Eastern Regional Agricultural Development Authority
FAO	Food and Agriculture Organization
GASC	General Agricultural Services Corporation
GDPM	General Directorate of Planning and Monitoring
GOY	Government of Yemen
GSMC	General Seeds Multiplication Corporation
HDI	Human Development Index
ICARDA	International Center for Agricultural Research in Dry Areas
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IDA	International Development Association
IF	Integrated Framework
LSBs	Livestock Sale Barns
M&O	Maintenance and operations
MAI	Ministry of Agriculture and Irrigation
MIS	Management information system
MOF	Ministry of Finance
MWE	Ministry of Water and Environment
NGOs	Non-governmental organizations
NRADA	Northern Regional Agricultural Development Authority
NWRA	National Water Resources Authority
RADA	Regional Agricultural Development Authority
RWDD	Rural Women Development Department
RWDGD	Rural Women Development General Directorate
SFD	Social Fund for Development
UNDP	United Nations Development Programme
WFP	World Food Programme
WUAs	Water User Associations

EXECUTIVE SUMMARY: KEY FINDINGS AND RECOMMENDATIONS

This study provides USAID/Yemen with an evaluation of the current status of restructuring in the Ministry of Agriculture and Irrigation (MAI). From this perspective, it then focuses on the potential of the Ministry to address the needs of the rain-fed crops and livestock subsectors and to address gender-specific constraints to productivity that exist in five strategic governorates—Sa’ada, Amran, Al-Jawf, Marib, and Shabwa—while working in conjunction with other agencies, non-governmental organizations (NGOs), and the private sector.

1. THE MINISTRY OF AGRICULTURE AND IRRIGATION AND ITS RESTRUCTURING

The MAI’s restructuring process, as initially laid out in the Aden Agenda and subsequently updated and expanded in the Agricultural Agenda for the 21st Century (A21A), is in mid-course. Many steps have been taken, but some of the most important restructuring requirements remain to be completed. High-priority steps that remain are:

- Completion of staff restructuring and downsizing in MAI and the agencies it supervises.
- Reforming the Ministry’s budgeting process to ensure that budgets reflect current program priorities and to provide adequate operating funds for Ministry activities.
- Finalizing the restructuring of Ministry services, particularly agricultural extension.

The restructuring process has gone slowly, due partly to deficiencies in MAI management:

- The program planning and budgeting process is very informal.
- Budgets reflect neither work plans nor stated MAI strategies and policies.
- Most Ministry departments do not prepare effective work plans.
- Many top-echelon MAI administrators have not been trained in the managerial process or in effective decision-making.
- There are deficiencies in MAI communications and information management.

Recommendations

- Provide technical assistance to design a tailored management training program that will improve MAI performance and, particularly, to support timely finalization of the restructuring process.
- Tailor the training program so as to concentrate on the upper-echelon decision-making process, program planning and budgeting, and information management. Training may include short-term foreign training (one–two weeks) and on-the-job training (workshops and round-table seminars) for MAI top management.
- Consider helping MAI establish a nucleus management information system (MIS) in the General Directorate of Planning and Monitoring, to strengthen the Ministry’s decision-making process.
- Follow the MAI restructuring process, and be prepared to consider complementary activities, including technical assistance and special studies, to support the finalization of the process.

1.1 AGRICULTURAL EXTENSION

The agricultural extension service is largely ineffective due to a number of factors, including a shortage of operating funds, lack of transportation and other logistic support, insufficient training, and excess staff.

Underlying many of the problems with extension at the national level is the fact that it has no effective coordinating or supervisory agency. MAI is currently considering ways to correct this deficiency. Resolution of this issue is considered to be urgent by top Ministry leadership. The Assessment Team concurs, and believes that the final choice of alternatives is likely to occur during the next few weeks or months.

Recommendation

- Consider providing technical assistance at the national level in the very near term, to advise the Ministry and to support the process of planning the reorganization of extension.

1.2 AGRICULTURAL RESEARCH

Agricultural research, carried out primarily through the Agricultural Research and Extension Authority (AREA), has focused heavily on irrigated agriculture, to the neglect of rain-fed crops. This is a critical deficiency, given the growing scarcity of water for irrigated crops and the shift to a concomitant, greater reliance on rain-fed crops. Some improved, locally selected seeds for wheat, barley, sorghum, and legumes have been developed by the AREA, but the multiplication and distribution of these by the General Seeds Multiplication Corporation (GSMC) is limited. The GSMC attempts to market its seed directly to farmers through cooperatives, and through the General Agricultural Services Corporation (GASC), which has little if any activity in the five governorates. The GSMC has not attempted to distribute through private dealers. The heavy subsidy on GSMC seed appears to be contrary to current agricultural policy and provides competition that inhibits the entry of private seed dealers.

Livestock is an important source of income to poor rural farmers and women, but research on livestock in the rain-fed grazing areas has also been weak, and improved breeds are not reaching these areas.

The research system suffers from failure to convert research findings into meaningful extension messages that reach farmers. The result is that rain-fed farmers are not getting practical recommendations on management practices or on use of more productive technologies.

Recommendations

- Reorient agricultural research planning, programs, and budgeting to address the problems of the rain-fed crop and livestock subsectors.
- Contract with an international institution such as ICARDA or ICRISAT,¹ to work with AREA to assemble relevant technical information and to identify available improved plant varieties and livestock breeds, which can easily be disseminated to the rain-fed farming communities.
- Help the GSMC revitalize a seed multiplication program and a seed quality control program for the rain-fed areas of the five governorates, to operate in conjunction with the appropriate branch units of GSMC and AREA research stations.

¹ICARDA is the International Center for Agricultural Research in Dry Areas, based in Aleppo, Syria. ICRISAT is the International Crops Research Institute for the Semi-Arid Tropics, based in Hyderabad, India. Both are supported under the Consortium for International Agricultural Research (CGIAR).

- Support the GSMC in carrying out seed distribution through its existing channels and in establishing new private sector distributors and dealers, working to ensure widespread coverage in the five governorates.
- Help establish a seed association made up of private and government sector seed growers and marketers to actively promote quality, standards, and distribution of information to the farmers.

1.3 AGRICULTURAL CREDIT AND FINANCE

Two semi-autonomous public financial intermediaries, the Cooperative and Agricultural Credit Bank (CACB) and the Agriculture and Fisheries Production Promotion Fund (AFPPF), make directed credits and grants for project financing in the agricultural sector. Both have been identified for restructuring under the *Agenda for 21st Century Agriculture (A21A)* (Decree No. 100 of 2000).

CACB has made very few loans in the five target governorates during the past few years. The bank offers loans at interest rates of 10–13%, compared with 23% at commercial banks. This reflects a high level of subsidy, which competes with private intermediaries. Between 25% and 30% of the bank's borrowers are in default, which means that it is virtually bankrupt. Plans for CACB restructuring are moving forward slowly. Meanwhile, most of its lending (\$7.3 million in 2002) is directed to exports, not to small farmers.

AFPPF financing, derived from a tax on diesel fuel sales, totaled around \$24 million in 2002. AFPPF is a main source of funding for small reservoirs and irrigation projects constructed by the General Directorate of Irrigation in MAI, as well as other public and productive infrastructure projects in the agricultural and fisheries sectors. There is little capacity within the Government of Yemen (GOY) to evaluate and prioritize project proposals to the AFPPF on an economic or environmental basis. This reduces the transparency of the AFPPF financing allocation process. The AFPPF also directs zero-interest loans to parastatals, cooperatives, and some private companies for agricultural input purchases and productive infrastructure investments. Repayment rates are very low, making the loans virtually indistinguishable from grants. This makes it difficult for both the CACB and private intermediaries to compete, and constitutes unfair competition to private agricultural input suppliers.

Recommendations

- Help CACB to establish restructuring benchmarks to be implemented within a discrete time frame, and make any additional donor financing of CACB for on-lending to the agricultural sector contingent on completion of those benchmarks.
- Increase the transparency of AFPPF project financing by establishing the institutional capacity within the GOY to evaluate project proposals based on economic and natural resource management criteria. Teach local institutions within target governorates how to develop economic and environmentally sound project proposals.
- Eliminate zero-interest AFPPF loans to prevent unfair competition with the CACB, private intermediaries, and private input suppliers.

2. AGRICULTURAL DEVELOPMENT NEEDS IN FIVE GOVERNORATES

All of the targeted governorates depend heavily on irrigation of crops by wells. The continuance of well irrigation is threatened by declining water tables. Saline water and related soil quality problems are already damaging citrus and other trees in some districts. As groundwater supplies continue to diminish, or are protected through improved natural resource management, farmers in these areas will need to learn to rely on rain-fed crops, as was the tradition in the past.

Rain-fed crop areas are devoted primarily to the food grains that are grown for subsistence purposes. Yields of sorghum and other grains are very low, and farmers have had little support from research and extension in increasing their production.

The other important productive resource that these areas will turn to as wells go out of production is livestock. Holdings of sheep and goats in these governorates are two to three times the national average herd size, but livestock production is constrained by critical shortages in feed and forage supplies. Range areas have been severely degraded by overgrazing. Livestock productivity is limited by serious and widespread animal diseases.

These governorates suffer from a variety of natural resource management problems, in addition to growing water scarcity and degraded grazing areas. Soil erosion along wadi banks, owing to flooding, is a problem in most areas, and desert encroachment is serious in Marib and Al-Jawf.

2.1 WHO ARE THE POOR FARMERS IN THESE GOVERNORATES?

The poorer farmers in these governorates are those who depend mainly on rain-fed crops. The poorest of the poor are those with little or no crop land, who depend primarily on livestock. Many of these are semi-nomadic herders, live in tents or crude shelters, and are often located far from improved roads and are difficult to reach. Many families headed by women are also poor. These are either widows or women whose husbands are away working and do not make enough money to send much home.

2.2 CROP MARKETING

Crop and livestock markets in the five governorates are completely informal and fragmented, with no management or organizational structure.

There are no post-harvest handling systems to handle fruit and vegetables, resulting in up to 50% loss of these products, which are produced with scarce and valuable groundwater. Products such as oranges, apples, and even tomatoes often arrive at local and regional *souks* piled in the back of a pickup truck.

Although some fruits and vegetables are traded locally, some are exported, either to other parts of Yemen or through northern borders to Saudi Arabia. Trade with the Saudis is impeded mainly by concerns over food safety and a lack of standardization and adequate packing. Only a small fraction of the potential for exporting to the lucrative Saudi market is being realized.

The GOY has recently constructed wholesale markets for fruits and vegetables in Sa'ada and Marib, and one is under construction in Shabwa. All three of the facilities are equipped with modern cold storage facilities that are also capable of storing fruits and vegetables as well as

chilled meats. These markets are all well designed, although they will require some additional improvements to operate effectively.

The Sa'ada market has only recently begun to operate. The cold rooms are being used on a limited basis. This market also has a locally constructed packing line for fresh fruits and vegetables that will require additional modification to operate properly. The local manager is inexperienced and will need considerable support to capitalize on these investments.

The market in Marib is not yet operating, due to local political issues and because of a problem with the generator for the cold storage. The national Agricultural Cooperative Union informed the Assessment Team that a cooperative from Dhamar has been assigned to operate the Marib market, and that the generator will soon be repaired and placed in operation.

These new wholesale markets with cold storage facilities offer a significant potential to reduce marketing bottlenecks for fruits and vegetables, to expand formal trade with Saudi Arabia, and to boost employment and the economies in the five governorates.

The potential of these markets will be realized only if they are managed properly and if the cooperatives that operate them ensure that they are open to all private marketers. Several agribusiness companies in the fruit and vegetable sector expressed an interest in using these facilities.

Recommendations

Provide technical assistance and management support for two of the new wholesale markets with cold storage facilities that were built to receive and process fruit and vegetables. This would include:

- Making minor but essential improvements to these facilities. This will include minor repair of the generator for the cold storage in the Marib market. Both markets will require asphalt paving of the outdoor area inside the perimeter fences and around the fruit and vegetable marketing stalls.
- Carrying out this work in conjunction with the cooperatives that have been assigned by MAI to manage these markets, but ensuring access by private agribusinesses that wish to use the facilities, based on reasonable user fees.
- Providing managerial and technical assistance to establish procedures for post-harvest collecting, handling, and packaging of fruits and vegetables from local farmers.
- Setting up small quality control laboratories in existing buildings of both facilities, and providing simple cleaning and packing lines that will pack fruits and vegetables to meet international standards.
- To support these activities, gather information from established export market facilities at Hodeida, to determine their quality control standards, packaging specifications, and availability of market information.
- On the basis of what is learned in the preceding step, consider promoting the organization of an association of growers and traders at the national level, which would work toward the establishment of workable national standards and update any existing laws or regulations.

2.3 LIVESTOCK MARKETING

Livestock markets are completely fragmented, with no formal structure and no market information. Animals are often sold in local *souks* in the midst of fruit and vegetable sellers. The souk setting, while colorful and interesting, is both disorganized and unsanitary.

Despite the importance of livestock to area farmers and herders, market development has been severely neglected. The lack of a formal marketing center such as a sales barn or sales yard with holding stalls, leaves the livestock producers at the mercy of “scalpers” who dominate the informal markets.

Improved livestock marketing is required as an incentive to improve and expand livestock production. It will enhance the benefits of feeding concentrates to small and large ruminants. Improved markets will provide an important additional source of income to livestock producers, and they will stimulate the economies in the governorates where they are located.

Recommendations

- Provide support to develop Livestock Sale Barns (LSBs), to be established in two or three of the governorates, aimed at establishing a formal marketing structure.
- The LSBs need be only simple fenced-in areas with roofed holding pens for segregation, located near but not directly adjacent to the fruit and vegetable processing and marketing centers. They would include several water tanks and feed bunks, dispersed throughout the enclosed area. This will allow traders and producers to hold animals overnight for sale the following day.
- The LSBs would be planned and approved by a group of interested traders, farmers, cooperatives, local officials, and sheikhs in the area. In addition to marketing services, they should provide updated market information, extension assistance, and veterinary assistance.
- The LSBs should be under the supervision of the Animal Production Department in the local agriculture or the Regional Agricultural Development Authority (RADA) office, or perhaps the local council, with a board of directors made up of traders, farmers, and cooperative members.
- The LSBs will require a small office for the manager and may include several livestock handlers. A fee would be assessed on the basis of the number of livestock brought in or held overnight by each user.

2.4 LIVESTOCK FEED AND FORAGE

Livestock feed and forage are in very short supply in all five governorates. The livestock sector has been seriously neglected by research and extension for many years. There have been some experiments with improved feeds for sheep, but with limited on-farm follow up and no attention to economic viability.

The commercial poultry and dairy sectors have demonstrated that they can operate effectively and economically on imported feedstuffs. Importation of feed grains and supplements has the potential to reduce the serious feed and forage bottleneck suffered by both small and large ruminants, to fill gaps in the feed calendar, and to take pressure off the rangeland.

Several commercial poultry producers have feed mills that operate in parts of the five governorates. These producers have experience in formulating balanced feed rations, and their mills have capacity to produce balanced feeds for small and large ruminants. They expressed strong interest to the Assessment Team in doing so.

Livestock farmers, particularly women, are not educated as to the value of properly feeding a nutritionally balanced ration. They are not aware of the benefits of such rations, such as faster gain, reduction in disease, better animal quality, more food for the family, and increased income.

If the feed-forage bottleneck can be overcome, these producers would be able to feed their families better, and there would be an expanded marketable surplus of larger, higher quality animals.

Recommendation

Consider supporting an applied research project for a demonstration farm that would evaluate the feasibility and value to the small farmer of an economically-balanced feeding program. The following points are integral to this program:

- The demonstration farm would be in one or two selected governorates. It would have several pens of sheep and goats, and perhaps cows, with one pen being fed a balanced feed ration and the other with local feeding practices.
- A logical place for one of the research demonstrations would be Marib, since the Eastern Regional Agricultural Development Authority (ERADA) staff there have already established a small sheep-feeding demonstration project.
- University or MAI economists and livestock nutritionists should be engaged in the design and layout of these activities, to evaluate alternative rations, to assess overall costs and returns, and to help identify alternative feeding and management practices.
- The demonstration will also provide a practical example of proper animal husbandry for the farmers. There should be a series of feed trial workshops for farmers brought in from the other governorates.
- The feed for the demonstration farm will be provided through a private sector feed mill. A cost-sharing program could also be considered that would be appropriate for this project and the private sector.

2.5 ROLE OF THE MAI AT THE GOVERNORATE LEVEL

The presence of MAI activities differs in these governorates. Four of the five governorates are served by RADAs that are semi-autonomous, but fall under the supervision of the MAI.

Sa'ada and Amran come under the Northern Regional Agricultural Development Authority (NRADA), which has its headquarters in Sana'a and offices in the two governorate capitals. The ERADA has its headquarters in Marib and an office in Al-Jawf. Shabwa has an *Office of Agriculture* located in Attaq, the governorate capital.

All of the governorate-level agricultural entities have extension services, and they carry out other activities such as design and construction of irrigation structures, control of soil erosion, and provision of veterinary service.

2.5.1 Agricultural extension

MAI-supported extension services are present in each of the governorates, but they lack logistic support and have very limited operating budgets. They have few vehicles, and there is a shortage of funds to buy fuel for the vehicles they do have.

In addition to offices in the governorate capitals, there are small extension centers in most districts, although they have very limited equipment. Few have vehicles, which makes it very difficult to visit farmers. Some of these centers are not operating at all.

The budget limitations faced by extension are at least partly explained by the fact that there is no separate program budget for extension.

Extension agents have had very little training during the past 6–10 years. Thus, many are poorly prepared to inform farmers on good practices, or to help them address production problems that may arise.

Extension agents lack current technical brochures to provide to farmers. There is little if any audio-visual equipment, which would often be preferable to providing written material, given the relatively high rate of illiteracy in farm women and older farmers.

There is no effective program guidance for extension at the local level. Although national policy emphasizes the need to focus on rain-fed crops and livestock, this is not reflected in the orientation of local programs.

Reflecting the past policies of government and donors, extension agents and local agricultural officials still work mainly with irrigation farmers. They do not know many rain-fed crop farmers or range livestock producers, nor are they well prepared to meet the needs of these groups.

The lack of training and the absence of program guidance at the local level reflect the failure of the extension system at the national level and, specifically, that there is no entity within MAI that is responsible for extension training or for overall coordination and supervision of extension.

The preceding limitations notwithstanding, the fact that extension centers are in place, and most of them with staff assigned, provides an opportunity to reach local farms, provided that extension receives relevant training and improved logistic support, particularly transportation.

Recommendations

- Improve extension support at the local level, specifically for rain-fed crop and livestock production, and also to support improved crop and livestock marketing.
- Provide specific operating budgets for extension activities.
- Improve transportation and other logistics support, in order to re-activate extension centers in districts that rely primarily on rain-fed crops, and in districts with heavy concentrations of poor livestock producers and herders.
- Provide training for selected extension staff to support crop and livestock production in targeted districts. This training should be organized to incorporate the latest information on rain-fed crop and livestock production available through the AREA and its regional stations.

- Training may be planned and organized with the assistance of the National Agricultural Training Center at Dhamar.
- If the Extension Service is reorganized at the national level, it may be more appropriate for the training to be planned and organized through the new extension authority or department in MAI, or whichever agency is given overall responsibility for extension.
- Consider enlisting ICARDA or ICRISAT to develop a training strategy and action plan. Consider, too, engaging the support of the Faculty of Agriculture at Sana'a University, or one of the other agricultural faculties.
- Training should also be designed to include representatives of the private sector (and NGOs or cooperatives, where appropriate), not only as trainees, but also as trainers, where their expertise merits. Consider contracting some specialized extension functions to the private sector.

2.5.2 Veterinary services and medicines

Veterinary services and medicines are vital to livestock producers in the rain-fed areas. All five governorates have serious problems in control of diseases, which are widespread within the livestock population.

In most governorates veterinary services are headed by veterinary doctors. The number of veterinary technicians varies widely from one governorate to the next. Coverage of veterinary service centers and technicians at the district level is limited. Many veterinary service centers no longer function, and services provided by others are limited due to insufficient budgets and logistic support.

The veterinary service facilities have a potential for addressing the widespread livestock disease problems, but this potential is not being realized because the centers are largely inoperative.

The veterinary services suffer from the same limitations in training, operating budget, equipment, transportation, and other logistic support noted for extension.

The majority of veterinary medicines that are available are distributed by the private sector dealers who have agents in the capitals and some of the main towns. The veterinary medicine dealers often provide advice to producers who buy medicines from them, but they often lack sufficient training to be very effective at this.

It is especially difficult for the many herders who operate in remote villages and range areas to reach government veterinarians or technicians with their sick animals, or to go to input shops for medicines and advice. The lack of vehicles is a serious constraint to veterinarians and input suppliers alike.

Recommendations

- Provide the financial and technical support necessary to reactivate the existing veterinary service centers in the districts of the five governorates.
- Provide *mobile veterinary units* to each of the five governorates. Equip these with field laboratories that are capable of providing the necessary treatment and diagnostic tools for field service application.

- Mobile units will work in conjunction with the reactivated district veterinary centers, to reach rural areas in districts that do not have centers. These units will be scheduled to arrive at designated villages during the local *souk day*.
- The units will also be equipped with an audio-visual aid system to broadcast educational information relevant to local agriculture and to broadcast the latest information on agricultural prices at nearby markets.
- The mobile units will be staffed with one professionally trained government veterinarian and a technical assistant.
- MAI contribution: to provide funds to stock the mobile unit with the necessary veterinary medicine to treat small and large ruminants. To prevent disruption and promote further development of existing markets, veterinary medical supplies will be purchased from the private sector in the governorates and disbursed to the farmer at cost price, without markup.

3. GENDER ROLES, CONSTRAINTS, NEEDS, AND OPPORTUNITIES

It is estimated that rural women provide about 75% of the labor required for crop and livestock production activities, in addition to their heavy family responsibilities in raising children, preparing food, and maintaining the household.

They are limited in carrying out these responsibilities because of ingrained social attitudes and sexual segregation. Yemeni women have specific needs related to their gender role. In the past, failure to recognize these needs has often resulted in the underachievement of development programs.

The work that rural women perform is usually carried out manually or with unimproved hand tools. They have not had support in obtaining improved technologies and labor-saving devices that will free up their very limited time. This has adverse effects on farm production and incomes in rural communities.

Rural women have little access to markets for agriculture and livestock products and inputs, since it is difficult for them to have business dealings with men other than their own family members. Even though women tend to dominate livestock production, they may require intermediaries to deal with veterinarians, who are generally male. Similar considerations limit their access to credit.

The MAI has taken steps to address the needs of rural women. The Rural Women Development General Directorate (RWDGD) has been developed in the Ministry, and female extension agents have been hired and posted in the rural authorities and agricultural offices in most of the governorates. Training has been provided for female extension agents in organization skills and gender analysis. They need more training in technical agricultural matters.

Field offices have been established for women agents in four governorates, and women's extension centers have been constructed in a few districts. These facilities lack transportation, logistic support, and audio-visual equipment.

The RWDGD has documented a number of technologies that would be particularly useful to rural women: rainwater harvesting systems for roofs; simple, improved hand tools; feeding troughs; improved poultry flocks; and improved shelters for animals and improved milk churns.

A project that provides sheep to poor women as a loan also shows great promise. The Assessment Team thinks that this project could succeed and be expanded if it were combined with better technical support.

The RWDGD and the women's extension offices in the five governorates provide a significant opportunity to achieve relatively quick impacts by addressing women's needs.

Recommendations

- Support and strengthen women's field units in the five governorates in terms of transportation, audio-visual equipment, and selected additional training.

- Support the women's extension program in establishing and strengthening women's groups (cooperatives, micro-credit groups, and other NGOs) to help women overcome their limitations in marketing, input procurement, and credit.
- Provide selected technical training to female extension agents and promote a stronger working relationship between female extension agents and male subject-matter specialists, in order to strengthen the female agents' capacity to support the crop and livestock production needs of farm women.
- Extension programs and other community training should include training and information on gender issues. This is designed to help farmers and community leaders develop an appreciation of the special needs of women, particularly the need for women to participate in community organizations and decision-making.
- Support the RWDGD and its field units in making the technologies listed above available to women in these governorates.
- In addition to water harvesting, the program should consider development of cisterns and other water system improvements that would be of particular use to women. In this regard it would be useful to consider similar programs of the Social Fund for Development (see section 3.1.5).
- Given the importance of sheep to rural women in the five governorates, it is particularly recommended that the program include a sheep component to provide in-kind loans of animals to poor women farmers. The program should provide adequate technical guidance to participating women.
- To provide the required technical support for sheep raising and other women's technologies, consider engaging ICARDA, Heifer International, or another NGO to help the RWDGD implement the program on sheep raising and special technologies for women. The supporting organization should have qualifications and experience in managing development livestock projects in settings similar to rural Yemen.
- Consider providing support to the RWDGD for developing a nationwide radio program that would address women's concerns in general, and agricultural and livestock issues in particular.

4. DONOR SUPPORT OF AGRICULTURE

During its visits to the agricultural areas of the five USAID target governorates, the Assessment Team observed numerous cases where equipment and facilities provided by donor projects had not been maintained and operated after the project was finished. This was true, for example, of the farming equipment and buildings at the demonstration farm in Amran Governorate, which were said to have been provided by a German project. It was also the case with many of the facilities that had been provided in the Agricultural Development Project funded by International Development Association in Al-Jawf.

The problem with inoperable equipment and facilities seems to be another facet of GOY and MAI's budgetary and planning problems in which established facilities and personnel are left without operating budgets.

Recommendations

- MAI and the Ministry of Finance must develop the planning and budgetary discipline required to provide sufficient maintenance and operations (M&O) funds for all of their activities, and particularly for projects after donor support has ended.
- Donors should (1) insist that, from the outset of a project, the counterpart government institution should assume a part of the M&O expenses associated with public facilities and activities supported by the project; (2) require that an increasing proportion of those M&O costs be assumed by the government institution as the project progresses each year; and (3) carry out effective monitoring and evaluation to ensure that M&O financing is continued by the relevant government institution after donor funding is completed.
- Donors should also ensure that their decision to support public and productive infrastructure investments is informed by feasibility studies that demonstrate the financial, economic, and environmental sustainability of the investments.

1. INTRODUCTION—OBJECTIVES AND APPROACH FOLLOWED IN THE ASSESSMENT

This study provides USAID/Yemen an evaluation of the current status of restructuring in the Ministry of Agriculture and Irrigation (MAI). From this perspective, it then focuses on the potential of the Ministry to address the needs of the rain-fed crops and livestock subsectors and to address gender-specific constraints to productivity that exist in five strategic governorates—Sa'ada, Amran, Al-Jawf, Marib, and Shabwa—while working in conjunction with other agencies, non-governmental organizations (NGOs) and the private sector.

Specific objectives of the assessment, as outlined in the ARD-RAISE Technical Proposal (see Annex 1), are to focus on:

- The structure of the MAI and its authorities.
- Comprehensive assessment of the strengths and weaknesses of the agricultural sector in five strategic governorates.
- Examination of gender roles, constraints, needs, and opportunities in agricultural production.
- Evaluation of the programs of the International Financial Institutions and other donor institutions and the Yemeni commitment to them.
- Recommendations to USAID about possible opportunities for increasing assistance to the agricultural sector.

The ARD Assessment Team assembled in Sana'a in early December 2003 to finalize the work plan with USAID and to commence the study.

Procedures were developed for conducting a rapid assessment of the agricultural sectors in the five strategic governorates. A team of three Yemeni scientists was engaged to assist in data collection and field visits. A list of peoples and organizations visited appears in Annex 2.

During December 2003 and January 2004, numerous meetings were held with MAI officials and agencies, other government entities, and agricultural businesses in Sana'a, Hodeida, and Dhamar. Information-gathering visits were paid to all five governorates by the national team, and to three of the five by the international consultants. Available agricultural statistics and other pertinent information were assembled for each governorate.

Discussions were held with the governor or deputy governor of each governorate, with local agricultural officials, and with agribusiness owners and managers. Farms in at least two different districts of each governorate were visited. Focus group meetings were held with separate gatherings of farmers, farm women, and local community leaders to obtain information and discuss area problems and needs.

Before the Team completed its work in Yemen in late January, a workshop was held to discuss draft findings and recommendations. The more than 50 participants in the workshop included officials of MAI, USAID, the Cooperative and Agricultural Credit Bank (CACB), the Agricultural Cooperative Union (ACU), the Northern Agricultural Development Authority (NRADA), Sana'a University Faculty of Agriculture, agricultural officials, and women extension agents from four of the five governorates. A copy of the Workshop Agenda is provided in Annex 3.

2. THE MINISTRY OF AGRICULTURE AND IRRIGATION AND ITS RESTRUCTURING

2.1 BACKGROUND AND INTRODUCTION

Yemen's agricultural sector grew rapidly during the 1970s and 1980s, spurred by a shift to higher valued irrigated crops and by the investment of remittances from workers who had migrated to nearby oil producing countries. This expansion was advanced by the commencement of Yemen's own oil exports in the mid-1980s, and by significant amounts of donor aid. In the agricultural sector, donor support was used to help create a dense network of services for farmers under the management of what is now known as the MAI.

The Yemeni economy experienced a number of disruptions during the 1990s. These began with the unification of the Arab Republic of Yemen and the People's Democratic Republic of Yemen in 1990, closely followed by the First Gulf War, in 1991, which resulted in the return of many Yemeni workers and the loss of their remittance income. The 1994 Civil War in Yemen was a severe shock to the economy. The closure of USAID/Yemen in 1995 also had an impact on the economy and, in particular, the agricultural sector, since U.S. assistance to that sector had been significant. These factors led to an imbalance in the economy, government programs, and the agricultural sector.

With encouragement from the IMF and the World Bank, the Government of Yemen (GOY) initiated a macroeconomic adjustment and structural reform program in 1995. This signaled a sharp break from past policies and established the broad outlines of the economic policy strategy still in place today. The fiscal component of the package included containment of government wages and a sharp reduction in subsidy costs by increasing prices on subsidized goods. To protect the most vulnerable segments of society, reforms of the education and health sectors and a social safety net were initiated.²

2.2 THE MAI, THE ADEN AGREEMENT, AND A21A

The MAI began a restructuring process in 1997. This was prompted by budgetary restrictions that resulted from the national restructuring and by the realization that the services and programs of MAI were not operating effectively. Research had become ineffective, and agricultural extension was largely inoperative. Subsidies on inputs had been greatly curtailed, but no means had been devised to make up for the stimulus and support these had supplied to farmers.

With the help of donors, a workshop was convened at the University of Aden in 1997. The purpose was to review the problems and constraints in the agricultural sector. This was followed by three studies carried out under the auspices of the World Bank: The Labor Force in the MAI (October 1998), Preparation of a Budget and Expenditure Adjustment Program (March 1999), and Field Services Review (April 1999). The outcome of all of this was a program of action accepted by MAI leadership, called the "Aden Agenda."

²See GOY, *Enhanced Structural Adjustment Facility, Medium-Term Economic and Financial Policy Framework Paper 1999-2001*, Prepared by the Yemeni Authorities in Collaboration with the Staff of the IMF and the World Bank, March 1999.

The Aden Agenda eventually evolved and was approved by the Cabinet of Ministers in 2000 as Decree No. 100, titled *Agenda for 21st Century Agriculture (A21A)*. Since then, the terms *Aden Agenda* and *A21A* have often been used interchangeably in the government and by donors.

Under the A21A a government's primary goal for agriculture is to create sustainable equitable growth in output and income, particularly for the poor. The A21A has also focused on promoting the role of the cooperative and private sectors, as well as reforming the provision of the MAI's services to the farming communities

Following cabinet approval of A21A, the MAI developed a framework, "Work Plan for Management of Change–A21A," which represents its plans for implementation. The A21A restructuring process is organized under five main components:

1. Redefining MAI policies and objectives at the national and local levels.
2. Preparation and implementation of revised strategies and programs.
3. Restructuring agricultural field services.
4. Reorganizing MAI human resources within the overall framework of public administration reform.
5. Restructuring the MAI budgeting process and adjusting expenditures, in line with the overall public sector reform and within the existing budget level.

To date, these components have been addressed in varying degrees, and the restructuring process is still in progress.

Also during 2000, the GOY formalized the process of decentralization of government programs and services in the *Law of Local Authority*. Decentralization has had an impact on MAI organization and on the implementation of A21A.

The following sections provide details on each of the restructuring components listed above and on steps that have been taken toward their achievement. This is followed by a discussion of the decentralization process as it affects the MAI, its services at the field level, and the restructuring process. The Team's discussion and understanding of these issues was greatly supported by a technical paper, *Aden Agenda and Its Implementation*, prepared by Farouk M. Kassem and Ali Gunaid Ali (see Annex 4).

2.2.1 Redefinition of MAI policies and objectives

Under the Aden Agenda and A21A, a number of goals have been clarified: (1) to improve food security, (2) to alleviate poverty, and (3) to promote sustainable development. Focus on these goals has resulted in a recognition that MAI needs to place more emphasis on food crops, which are mainly rain-fed, and on livestock production. It has also been understood that this means targeting women farmers since they are mainly responsible for the food crops and livestock.

The increased focus on women was reflected in the decision in 1999 to upgrade the Rural Women's Development Department (RWDD) to the Rural Women's Development General Directorate (RWDGD) in order to allow the Director to participate in policy meetings. This signalled that the relevance of women and gender considerations were recognized at a high level in the MAI.

There has also been explicit recognition in the MAI that rain-fed crop production is more sustainable than irrigation farming, although the Ministry has been slow to realign its programs to reflect this.

The revised functions, policies, and objectives of the MAI and related organizations are reflected by the enactment of several recent laws, including:

- *Seeds and Agricultural Fertilizers Law No. 20, enacted in 1998.* The main provisions under this law focus on regulation and registration of approved seeds and plants; regulation and handling of fertilizers to avoid risk effects on human and animal health, plants, soil fertility, and the environment; and encouraging the private sector to play the primary role in the delivery of agricultural inputs, especially seeds and agro-chemicals.
- *Plant Quarantine Law No. 32, enacted in 1999.* The main provisions under this law focus on protecting plant resources from pests and diseases, especially through the organization and control of importation of plant materials.
- *Water Law No. 33, enacted in 2002.* The main provisions under this law focus on regulation, management, and development of water resources. Under this legislation, the newly established Ministry of Water and Environment (MWE) is charged with general oversight and establishment of policy on water resources. The MAI, through the General Directorate of Irrigation, retains responsibility for irrigation projects and oversight of irrigation management. The law encourages the formation of water user groups and associations as well as a private sector role in the conservation and management of water resources.

A number of other laws that will reflect the intent of A21A are still under preparation: the Law for Management and Protection of Animal Resource, the Land Conservation Law, and the Rangeland Law. The laws are meant to streamline the function and role of the MAI and related organizations in these matters.

2.2.2 Revised strategies and programs

Progress has been made in the preparation of revised strategies and programs under A21A. Reportedly, new strategies have been outlined in the following areas:

- Irrigation improvement.
- Animal production.
- Restructuring the CACB.
- Restructuring the Agricultural and Fisheries Production Promotion Fund (AFPPF).
- Establishment of an improved management information system (MIS) within the MAI.
- Transfer of the agricultural technologies to farmers.
- Creating awareness among MAI staff about the strategies and policies to be adopted and implemented under the A21A.

The Assessment Team was not able to review these strategies in detail or to determine progress in their implementation. Reportedly, progress has been made in implementing the irrigation improvement strategy, the animal production strategy, and the restructuring of the CACB.

The Team learned that the Netherlands' Government had provided support to study restructuring the CACB; that study, however, has been discontinued, and it appears that there are no definite plans as to when it will be resumed.

The Team was told that no steps have been taken toward the restructuring of the AFPPF.

2.2.3 Restructuring agricultural field services

Numerous public and private goods and services are provided to farmers through the MAI and through MAI-supervised authorities and organizations. These are referred to generally as “agricultural field services.” They include extension, research, credit, input supply, machinery services, marketing, veterinary services, and others.

Steps toward implementing A21A in terms of strengthening technical capacity of some of MAI institutions include:

- Strengthening technical capacity in the irrigation subsector (Directorate of Irrigation [DOI]) in 1999 through providing technical assistance under International Development Association (IDA) financing.
- Capacity building for Agricultural Cooperative Development through technical assistance provided through the UN’s Food and Agriculture Organization (FAO).

Prior to the restructuring, the role of the cooperative and private sectors in providing field services was limited. It consisted mainly of providing subsidized inputs such as agro-chemicals, irrigation equipment, and machinery, and in some instances providing crop marketing services. The private sector provided similar services but was limited by MAI procedures and regulations in most of these areas.

The untimely and unreliable delivery of field services by MAI organizations contributed to the weak performance and development of the agriculture sector. Poor MAI performance became particularly evident when the extension programs, machinery services, and other activities begun under donor-funded projects often became inoperable after donor support ended, due to MAI administrative and budgetary insufficiency.

The procedures set up under the Aden Agenda and A21A called for reform in the delivery of field services, following the principles that “public goods” should be delivered by the MAI and its organs while “private goods” are to be delivered by the private and cooperative sectors at market prices. Ultimately this evolved into a three-way allocation of responsibility for services, as shown in Table 2.1.

Table 2.1 Allocation of Agricultural Field Services under A21A

To Be Retained in the Public Sector and Improved	To Be Shared by Public and Non-Public Providers	To Be Provided by the Private Sector and Cooperatives
Research Plant and Animal Quarantine Animal and Plant Protection (Public Interest Aspects) Natural Resource Management Oversight Promotion of Farmer Organizations	Agricultural Extension Animal and Plant Protection (Non-public Interest Aspects) Nursery Tree Production (Forest Trees) Spate Irrigation Management Agricultural Credit	Input Supply Seed Supply Machinery Rental Nursery Tree Production (Fruit Trees)

Source: A21A and World Bank, *Republic of Yemen, Agricultural Strategy Note*, 1999.

Agricultural Research

Research is considered to be a public good and is primarily the responsibility of the Agricultural Research and Extension Authority (AREA), with headquarters in Dhamar, and its regional research stations located in principal agricultural zones of the country. It is envisaged under A21A that research will be applied, problem-solving, demand-driven, linked to policy targets, and aimed at producing quick positive results. It is also envisioned that research on livestock and rain-fed farming will be given due consideration in the research strategy to be adopted and implemented by the AREA.

Furthermore, it is suggested under the Aden Agenda that to achieve quality research, it is necessary to have the following requirements:

- Adequate and reliable recurrent financing for research activities.
- Reasonable distribution of professional staff among AREA substations.
- University research should be encouraged through a competitive grants approach.

During the time the Aden Agenda was initially being developed, the AREA produced its *Agricultural Research Strategy* statement, with the support of the Agricultural Sector Management Support Project funded by the World Bank and the International Center for Agricultural Research in the Dry Areas (ICARDA).³

The strategy emphasizes, among other things, the need to place “higher priorities to research on rain-fed crop production, resource management, livestock improvement, and socioeconomic research.” It was stated that national research centers would be established on livestock production, post-harvest technology, and resource management. According to AREA literature, such centers have now been established.⁴

In its brief visit to the AREA headquarters, the Assessment Team was unable to determine the extent to which the AREA is meeting the research priorities stated in its *Strategy* statement. Except for the Eastern Region Research Station in Marib, it was not possible for the Team to visit AREA’s stations or centers. On the basis of the visit to Marib, the Team concluded that no sharp focus has been developed on rain-fed cropping systems or on livestock. Researchers indicated that they have identified some improved grain varieties for rain-fed areas, but there is no well-defined program for multiplying these seeds, and it is certain that no strategy has been developed for spreading improved seeds and related production practices to farmers. Some improved sheep breeds have been selected, but there is only a very limited procedure for getting improved animals into the hands of farmers.

Extension

MAI’s extension service is staffed by more than 1,300 MAI extension agents, subject-matter specialists, and supervisors stationed in agricultural offices and district extension centers located

³Printed by ICARDA, Aleppo, Syria and issued at Dhamar, December 1997.

⁴These are the Renewable Natural Resources Research Center, Dhamar; Livestock Research Center, Lahj; and Food Technology and Post Harvest Research Center, Aden. The Assessment Team did not determine the dates of establishment or nature of the research programs of these centers.

throughout the country. However, this system is widely described by MAI officials, extension agents, and farmers as being “inactive,” “weak,” and “ineffective.”

It is envisioned under the Aden Agenda that for effective dissemination of information, the skills of the extension agents should be maintained and improved through specialized refresher courses and on-the-job-training. It is also indicated that strong linkages will be established between researchers and extension agents on one hand, and extension and the farming communities on the other. Furthermore, the use of multimedia is viewed as an essential tool for dissemination of extension information.

There are a number of obvious reasons for the current weakness of the extension system. The field offices lack logistic support and operating funds. There are relatively few vehicles, and there is no audio-visual equipment. Few technical information brochures are available, and the ones that are available are outdated.

One of the main problems with extension is that there is no coordination unit or overall supervisory unit at the national level. Although AREA’s name (Agricultural Research *and* Extension Authority) implies that it would be the national agency responsible for extension, this is not the case. The AREA claims that it is responsible only for “research on extension.” With no national agency responsible for extension, there is no one to advocate for the needs of the system at the national level. No one is responsible for providing program guidance to the field units.

Recognizing this problem, the MAI, in coordination with the AREA, convened a workshop in Sana’a in the third week of January 2004. The workshop was attended by many extension agents and supervisors from around the country, as well as by university staff and MAI and AREA officials. Attendees discussed three main options for reforming the institutional arrangement for extension:

1. To create a General Directorate of Extension within MAI that would coordinate and promote the relationship among extension agents, AREA researchers, and the farming community.
2. To create a semi-autonomous institution to be responsible for extension.
3. To improve the effectiveness of extension within the AREA by providing that agency with the necessary budget.

No decision has been made on this issue as yet. Making the correct decision has the potential to put extension on a sound basis and greatly improve its efficiency.

Private sector extension services are envisaged under A21A. Private sector input dealers and traders already provide significant amounts of valuable information to farmers and livestock producers in the course of selling them chemicals, fertilizers, and veterinary medicines. Given the currently weak status of the government extension services, it is likely that farmers probably obtain more information from the private sector in this way than they do from the MAI extension agents.

In addition to the information provided in the course of daily input sales, private companies do organize meetings to provide technical information to their dealers and to key farm clients. In some cases, government extension agents provide consulting services outside their official

working hours to larger private farms for a fee. This is similar to the private consulting services that farmers often use in countries with advanced commercial agriculture systems.

Private extension services like the preceding could be greatly expanded, particularly for crops such as mangos and oranges, where the value is high enough that the farmer can afford to pay for a specialized service. The government (MAI) could encourage the private sector by cooperating with them and including them in training activities. This could be done in cooperation with the Yemen Traders Association for Agricultural Materials, which represents the input traders. The president of the Association expressed interest to the Assessment Team in such cooperation.

Veterinary Services

According to A21A the control of infectious livestock diseases (e.g., *rinderpest*) and quarantine measures is considered a “public good” since there is a public interest in seeing that such diseases are controlled or eliminated. However, other veterinary services, including laboratory tests, diagnosis of ordinary animal medical problems, and dispensing veterinary drugs, are considered private goods. The private sector is expected to provide these services at market prices to both the commercial livestock sector and to small herders.

The MAI has veterinary service centers, with veterinary doctors and technicians, located in all governorates and in many districts. These centers formerly dispensed medicines free of charge or at subsidized prices, provided free veterinary services, and carried out national campaigns against infectious livestock disease. Reportedly, the services were not that good, and the national campaigns were not very effective. Now, however, the centers and veterinary personnel lack funds to provide services. Many of the centers have become inactive, and livestock disease problems are widespread.

Natural Resource Management

Natural resources in Yemen are scarce, and the services for their conservation and management, such as groundwater conservation, control of fertile soils against erosion, terrace rehabilitation, watershed management, and curbing desertification, are in the public interest. Thus, it is intended that the relevant MAI institutions will continue to provide these activities.

Construction of Irrigation Projects. Since enactment of the new Water Law, the MAI is no longer responsible for rural drinking water supplies. However, the DOI does still evaluate, design, and supervise the construction of irrigation projects. Some of these are funded through the regular MAI investment budget, while others are funded by the AFPPF. DOI’s critics claim that the criteria used by the agency to evaluate these projects are not transparent, and that the DOI fails to do adequate benefit-cost analysis.

Spate Irrigation Management. A21A envisions that the sustainability and effective maintenance and operation (M&O) of large spate irrigation schemes, which were primarily built by the public sector through foreign financing, will depend on the participatory role of the beneficiaries in terms of cash or in-kind contribution toward M&O costs. Users are also expected to become active in management of these at the structure level and down to the main and secondary canals.

Water user associations (WUAs) are planned as the vehicle for enabling users to participate in the finance and operation of these systems. Reportedly, some WUAs have already been established, but no details are available on how these groups are organized or how well they function.

Agricultural Credit

It is envisioned under A21A that reforming the CACB is central to the creation of effective and practical rural credit market. The objective of the reform will focus on progressive transformation of the CACB into rural saving and credit bank. The elements anticipated under the A21A for reforming the CACB include elimination of subsidies on interest rate, paying market rates to depositors for savings deposits, improved management, reduced operating costs, and trying innovative approaches for rural group lending.

Reform along the above lines will require strong government commitment and detailed studies (technical assistance). As noted above, studies related to restructuring of the CACB were suspended. However, the CACB's chairman, who was appointed very recently, has indicated his strong commitment to restructuring CACB along the lines stated in the Aden Agenda, and he is reported to have the backing of the Prime Minister. The restructuring process may soon resume.

The Private and Cooperative Agribusiness Sectors

The Aden Agenda states that the supply of agricultural inputs to the farming communities should be the sole responsibility of the private and the cooperative sectors, provided that the cooperative sector operates on a competitive basis and eliminates direct and indirect subsidies to farmers.

The Agricultural Service Corporation (ASC) is the MAI agency responsible for selling subsidized inputs and irrigation equipment to farmers. On the basis of the A21A requirements, the MAI has determined that the ASC will be liquidated. The Assessment Team was told that an agreement has been reached to do this by the summer of 2004.

With the support of the IDA, the MAI has started privatizing some of its agencies that working in the area of input supply and delivery. In this regard, the Assessment Team was informed that:

- The Vegetable Seed Company has been privatized.
- The Potato Seed Company is currently under evaluation for sale to the private sector.
- The Machinery Rental Center in Hadramout has been sold to the labor force that works for the company. Reportedly, other machinery centers still remain to be sold.
- Sale of several MAI well drilling companies, the Tuban Authority, the Abyan Authority, and the General Corporation for Drilling is reported to be in progress.
- While no specifics were provided, the Team was also told that a number of Ministry-owned dairies have been privatized.

The MAI has determined that it will not sell some entities. The General Seed Multiplication Corporation (GSMC), with its headquarters next to AREA in Dhamar, will not be sold because the Ministry thinks that there is not enough potential profit in the basic grain seeds that it produces to attract the private sector. The GSMC continues to sell its seed at significant subsidies, and it would appear that MAI intends to maintain this policy.

Furthermore, operating forest tree nurseries will continue to be the responsibility of the General Directorate of Forestry and Desertification Control, since the promotion of re-forestation is considered to be in the public interest.

2.2.4 Reorganizing MAI human resources

In general most the MAI institutions are overstaffed, resulting in a high level of disguised unemployment. Statistics shows that the total number of employees in MAI is around 14,000. Staff with university degrees and with specialized professional training represent 20% of all MAI employees, those with secondary school certificates make up 14%, and those with less than secondary education represent 66%.

Most of the qualified and professional staff in almost all of the agricultural organizations are located in cities. They seldom spend much time in rural areas. Statistics also indicate the ratio of supporting staff to the professional staff is 7:1, while ideally it should not exceed 2:1.

Women employees in the agricultural institutions represent less than 10% of the total employees of the MAI. The total number of professional women employees (i.e., B.Sc. level and higher) is about 175, representing about 8% of the total professional employees in the MAI. Furthermore, women's units either do not exist or are understaffed in many agricultural offices of the governorates. Considering the importance of women in agriculture and the current focus of the MAI's strategies on women, the current female-to-male balance appears to be seriously out of line.

The distribution of qualified and specialized agricultural employees among most of the agricultural institutions is not in proportion to the workload and expected output. This is because a high number of qualified and specialized agricultural staff are assigned to some locations and agencies (e.g., Aden Office of Agriculture, Abyan, Lahej, Hadramout, and the General Directorate of Irrigation and Land Reclamation in Sana'a); professional staff in other institutions (e.g., Marib Research Station) is quite inadequate.

The Aden Agenda called for a significant reduction of MAI staff to 37% of the existing staff in 1997 through managed retirement, early compensation, freeze on new appointments, and privatization of some MAI institutions program. The Aden Agenda also advocated improvement of the skills and recruitment of more women and reallocation of savings from staff reduction, to increasing operating budgets for field services, to training and to paying compensation for reduced staff.

The MAI has already prepared a manpower restructuring program as part of A21A. The implementation of many components of this program is in progress. These components include:

- Setting criteria for restricted new appointments during 2001–2005.
- A freeze on all new hiring during 2004.
- Completing and maintaining a database for MAI personnel.
- Preparation of a job description system.
- Design of a training program to improve the skills and qualification of MAI staff.
- Deleting job duplication and removing no-longer-employed people from MAI payroll in accordance with civil service rules.
- Applying established criteria for retirement.

These are meaningful steps, but full implementation of the restructuring requires more determination, commitment, and still more planning.

The MAI has prepared a detailed study and inventory for its human resources. The study shows the dates of appointment of all MAI employees and the likely dates for their retirement. The study also shows the qualification of each of the MAI employees, and it also identifies staff who have no relevance to the Ministry's mission.

The Deputy Minister told the Assessment Team that more than 5,000 of MAI employees have been transferred to other institutions through the civil service, and more will be transferred as more MAI organizations are privatized. It is not clear just how many more would need to be transferred, retired, or dismissed in order to meet the Aden Agenda's goals or the MAI's realistic needs. Obviously, however, the overstaffing is still substantial.

The MAI has not implemented its planned training program to upgrade the skills and build the capacity of its staff. The implementation of such a training program would definitely improve the capability of the professional staff to effectively execute the agricultural development programs and activities. The training programs implemented through foreign-funded projects did not fall under an overall training program prepared and sponsored by MAI and represent limited isolated endeavor.

To complete the restructuring process, it will probably be necessary to dismiss a certain number of personnel because it will simply be impossible to transfer enough to other agencies through the civil service system. Layoffs will require compensation. It appears that the exact procedures for this and the amount of compensation are not fully specified under Yemeni civil service regulations. Thus, to complete the process will require negotiating both with MAI employees and with an organization that lies outside MAI.

2.2.5 Restructuring the MAI budgeting process

The Aden Agenda emphasized that budget restructuring will focus on increasing the operating cost per employee, increasing average salaries of MAI employees, improving efficiency and value of money spent, use of program budgeting, and promoting privatization.

The MAI has obtained Cabinet approval, under a resolution of April 2000, to support MAI's budget restructuring program as part of the overall restructuring process. It was reported in A21A (in 2000) that the implementation of the main components of MAI budget restructuring process were already in progress. These components include:

- That the budget planning stay within the an overall budget total ceiling.
- Increasing the operating budget progressively.
- Preparation of a new salary system that focuses on increasing average salaries as a result of staff reduction.
- Improving the budget planning and expenditure monitoring system.

Although these components may be "in progress," during its visit the Assessment Team did not observe ongoing activities or practical impacts that reflected them in the ongoing activities of the MAI.

The Team concluded that the widely observed limitation in operating funds for extension and other MAI activities is partly a reflection of a flawed planning and budgeting process in the Ministry itself. Budgeting is not based on work plans that reflect the current MAI strategies and agricultural policies. Work plans are not developed by most of the departments and agencies because the managers in these agencies simply do not have the training and ability to develop budgets that are useful for management.

Intensive discussions with the General Director of Finance and the General Director of Planning and Monitoring (GDPM) revealed that an organized process of program planning and budgeting needs to be strengthened at both the national and local levels.

The reform of the budgeting process depends of the reform in the human resources, in two ways. The first is training: managers in the departments and agencies need training in how to develop work plans and in how to budget based on work plans. Second, the overstaffing problem must be dealt with, not only to be able to increase salaries of the remaining employees, but also to save part of the money that the MAI needs to increase its operating budget.

2.3 IMPLICATIONS OF DECENTRALIZATION ON MAI STRUCTURE

The *Law of Local Authority*, enacted in the year 2000, was aimed at decentralizing the GOY. Inter alia, it modified the relationship between the existing organs of the MAI at the governorate level and the MAI at the national level. According to this new law, the Agricultural Office in each governorate will, financially and administratively, come under the jurisdiction of the Governor's office and technically under the MAI's direct supervision. However, the Law of Local Authority excluded the Regional Agricultural Development Authorities (RADAs) from this process because they are semi-autonomous entities. Thus, the system now operates differently in governorates that come under one of the RADAs.

The Local Authority System is based on the principles of administrative and financial decentralization, and on the basis of the people's participation in decision-making and management. This introduces the role of elected local councils in various types of development activities, such as the identification or proposal of local roads and water projects.

Under the Law of Local Authority, the annual budgets for the agricultural offices in the governorates are to be part of the governorate budget. However, this is yet to be implemented in all governorates.

It is too early to evaluate the implications of the decentralization on MAI agricultural offices. Since drinking water, health services, and education represent the immediate needs of the people at the districts and local council levels, the extension service may represent a lower priority and, accordingly, a lower budget allocation. Thus, the budget allocated to the agricultural offices may not be adequate to meet the planned agricultural programs.

2.4 MAI'S RELATIONSHIP TO THE AGRIBUSINESS SECTOR AND ACADEMIA

Agricultural Cooperatives. The Aden Agenda strengthened the relationship between the MAI and the agricultural cooperative sector. With guidance from the MAI, the cooperative movement has been unified under the Agricultural Cooperative Union (ACU). The promotion and develop-

ment of the cooperative sector are integral components of MAI's strategy, particularly now that the Ministry itself has been required to drop out of the input distribution business.

The MAI provides budgetary support to the cooperative sector through the AFPPF (the ACU receives 2% of AFPPF diesel tax receipts). The overall objectives of the cooperative sector complement those of the MAI. The cooperative movement has been active in implementing productive infrastructure projects such as wholesale markets, dairy farms, small dams, spate diversions, and weirs in addition to the supply of water-saving technologies to farmers. The Agricultural Cooperative Associations provide their services to farmers, members and non-members alike.

Women cooperative associations are under the umbrella of the ACU. Separate women cooperative associations are quite few, and in most cases women are members in mixed cooperative associations. The General Directorate of Women in Development in the MAI has a limited and indirect relationship with the women department in the ACU.

Private Agribusiness. While the withdrawal of the MAI from its subsidized input distribution activities has provided incentives for private sector agribusiness to expand, the MAI has not developed a very close working relationship with the private sector. Furthermore, the private sector still has reasons to distrust the MAI, since it requires that they submit a lot of documentation for product registration. The two sectors could benefit from working more closely with each other, especially in the area of extension. There are some potential opportunities for the private sector to provide extension services, for example, and the MAI would benefit from having them do so. Their working with the private farms would free the MAI extension agents to do other things.

Academic community. There exist five faculties of agriculture in Yemen. Each faculty has around 50–70 professional staff in different disciplines of agricultural sciences. Beside teaching undergraduates, the staff are expected to conduct research and supervise graduate student's research.

The level of coordination between the MAI and the faculties of agriculture is quite weak or non-existent in research area (i.e., the MAI does not provide research funds for the university staff to conduct applied research). The professional staff of the faculties of agriculture represent a human resource asset that the MAI is not currently using. The faculties of agriculture could provide excellent local training opportunities for MAI staff (e.g., workshops, seminars, and short- and long-term training) if appropriate arrangements are worked out. However, in reality there is no (or minimal at best) institutional relationship between the MAI and the staff of the faculties of agriculture. Some individual faculty staff are employed on the basis of their personal merits by the MAI as private consultants to conduct some studies. The MAI occasionally requests that short- or long-term training be offered in the Faculty of Agriculture–Sana'a University.

2.5 SYNTHESIS OF FINDINGS AND RECOMMENDATIONS

The principles and guidelines for the restructuring of the MAI were outlined in the Aden Agenda and then elaborated on in the Cabinet decree, A21A.

Although the MAI has taken many significant steps in the process of restructuring, the process is far from complete. Significant tasks remain:

- Completion of several policy and strategy statements.

- Completion of the privatization of a number of Ministry agencies.
- Deciding on how to reorganize the top echelon of the management system for agricultural extension.
- Restructuring the CACB.
- Restructuring the AFPPF.
- Completion of the restructuring and downsizing of MAI's human resources.
- Restructuring MAI's budgeting process.

Restructuring of MAI's human resources, budgeting, and field services is a complex, integrated process. The components are interrelated and need to be addressed concurrently. The donors and the Cabinet of Ministers are pressing the MAI to push forcefully to complete the restructuring process.

In view of its pressing need for technical support to get the job done, the MAI will soon sign a one-year project agreement with the FAO in order to move forward. The proposed project has two components:

1. Strengthening and improving decision-making process in the office of the Deputy Minister.
2. Preparation of a study to review MAI institutions and recommend different options for restructuring them. These options will then be further explored and tested during a three-year follow-on project.

On the basis of the above, and from experience in Egypt, Uganda, and elsewhere, it is evident that the completion of the restructuring program could still take 3–5 years. In the meantime, immediate actions to improve the performance of the agricultural sector must be taken.

Recommendation

- USAID closely observe MAI's restructuring process and consider providing technical assistance to support the restructuring process. The agricultural sector's management, program budgeting, and budget monitoring are weak. Coordination between MAI's institutions is quite low or lacking. MAI leadership has expressed its desire that USAID provide technical assistance to strengthen MAI management so that it is able to improve its operations and complete the restructuring process.

Recommendations

- Strengthen MAI top management by providing tailored short-term training, workshops, and seminars to improve the decision-making process, program budgeting, and level of coordination between MAI's institutions.
- Provide technical assistance both to design and execute the training program. Subject matter of the training would be the decision-making process, program budgeting, use of management information, financial management, and program planning and evaluation.
- The proposed training may include short-term foreign training (two weeks) and on-the-job training (workshops and roundtable seminars) for MAI top management.

The MAI requires better management information to improve its decision-making and operational efficiency and to support the further development of the agricultural sector.

Recommendation

- USAID support the establishment of a nucleus MIS in the GDPM of the MAI, to strengthen MAI's decision-making process.

Despite policy statements that it will focus more on the rain-fed food crops and livestock production, research programs of the AREA still do not focus sufficiently on these objectives. Specifically, improved technologies (seeds) and management practices have not been sufficiently identified and prepared for extension. AREA's linkages with extension are weak. Thus, the improved inputs, information, and practical recommendations that rain-fed farmers and livestock producers require are not available to them.

Recommendations

- Agricultural research be oriented more to address rain-fed crop and livestock production problems.
- USAID consider supporting the engagement of an international institution like ICARDA or ICRISAT to work closely with the AREA to document relevant technical information that can easily and quickly be adapted and disseminated to the rain-fed farming communities.

The agricultural extension service is largely ineffective due to a number of factors, including a shortage of operating funds, lack of transportation and other logistic support, insufficient training, and excess staff.

Underlying many of the problems with extension at the national level is the fact that it has no effective coordinating or supervisory agency. The MAI is currently in the process of considering ways to correct this deficiency. Resolution of this issue is considered to be urgent by top ministry leadership. The Assessment Team concurs, and believes that the final choice of alternatives is likely to occur during the next few weeks or months.

Recommendation

- Consider providing technical assistance at the national level in the very near term, to advise the Ministry and to support the process of planning the reorganization of extension.

The ACU and its member cooperatives are providing agricultural inputs (fertilizers, irrigation equipment, machinery) to farmers at subsidized prices. These subsidies serve as a disincentive to private sector input suppliers to provide inputs, and it makes it difficult for them to compete.

Recommendation

- The MAI should encourage the ACU to remove all subsidies on farm inputs.

The MAI has a very limited relationship with the academic community and private sector agribusinesses. However, both the academic community and the private sector have valuable resources and programs that can be quite productive if appropriately used in a cooperative working environment. University staff members and the professionally trained personnel in the private sector have useful skills and are capable of providing training. They could also improve their skills by participating as trainees in MAI training programs. The academic community and the private sector are also capable of conducting applied research. The private sector is active in dis-

semination of information on production practices, which is a form of extension, but the sector's extension efforts could be expanded greatly if it were encouraged to do so.

Recommendations

- Support applied research to be conducted by the universities, NGOs, and private agribusiness companies, on a competitive basis in the five governorates.
- Support private sector and university involvement in extension and training programs in the five governorates.

3. EXAMINATION OF THE AGRICULTURAL SECTOR, WITH FOCUS ON THE FIVE GOVERNORATES

3.1 YEMEN'S AGRICULTURAL SECTOR⁵

Yemen continues to be one of the least developed countries in the world. While overall development, as measured by the Human Development Index (HDI), increased from 0.242 to 0.489 over the last decade, Yemen still ranks 148 in a list of 174 countries, according to the United Nations Development Programme (UNDP) Global Human Development Report for 2003. The same source reports Yemen's GDP at US \$790⁶ per capita for 2001. This was considerably lower than the \$5,038 per-capita average for all Arab countries and the \$1,274 per capita for "least developed countries" as a group, reported by UNDP.

Yemen's low economic performance is a direct reflection of its heavy dependence on agriculture. Of the current population of 18.7 million, about 73% live in rural areas. Although agriculture has long been the dominant sector in terms of employment, the proportion of national GDP contributed by the sector has declined consistently over the past three decades, particularly since the commencement of oil production in the 1980s.

Agriculture provides 58% of all employment in Yemen, yet it accounted for only 15.3% of GDP in 2000, down from 24.2% in 1990. The low proportion of GDP contribution compared with that of employment is a direct reflection of the low productivity of Yemeni agriculture.

One of the results of Yemen's low per-capita income and dependence on low-productivity agriculture is widespread malnutrition. The average diet currently provides just 2,045 calories per day, which is little changed from the 2,010-calorie average of a decade ago and the 1,945-calorie average in 1980–1981 (Annex 5).⁷

3.1.1 Structure and trends

Yemen's agricultural output is derived from production of rain-fed and irrigated crops, livestock, forestry, and fisheries. Since fisheries⁸ and forestry account for less than 10% of agricultural GDP, crop and livestock production account for over 90% of the sector's value. Roundly speaking, the value produced in the crop-livestock subsector can be divided into three categories of similar value: a third is attributed to livestock, a third is derived from *qat*,⁹ and a third is attributable to all other crops, both rain-fed and irrigated.

⁵Development of this section benefited greatly from a World Bank Study, *Republic of Yemen, Agricultural Strategy Note, Rural Development, Water and Environment Department, MENA Region*, May 1999.

⁶The UNDP measure of GDP is based on the *purchasing power parity* method. This results in substantially higher estimates of Yemen's per-capita income than when market prices are used as a basis of calculations. The World Bank reports Yemen's *gross national income* per capita at \$490 for 2002 (<http://www.dworldbank.org/data/>).

⁷For purposes of comparison, Yemen's current level of food energy is similar to that of Bangladesh (2,100 calories), somewhat higher than Ethiopia (1,880), and substantially less than that of Egypt and Syria (3,320 and 3,050 calories, respectively) (FAOSTAT, Food Balance Sheets).

⁸The considerable potential for increased fish harvest and exports is outside the scope of this report.

⁹*Qat* is a stimulant leaf chewed on a daily basis by most Yemeni adults. The WHO considers *qat* to have amphetamine-like properties and categorizes it as a separate drug group in which it is the sole element.

Cropping patterns and productivity are closely related to moisture availability. Except for limited areas in the western highlands, Yemen is a very arid country. Rainfall increases from 50 mm/year in the Red Sea and Gulf of Aden coastal areas to a maximum of 500–800 mm in the western highlands and decreases steadily to below 50 mm in most of the northern and eastern parts of the country.

Traditionally, crop production depended on rainfall, where it was sufficient. In areas of lower precipitation, crops were grown either with water from springs or shallow wells, or with spate irrigation.¹⁰ Terracing is another traditional form of water harvesting that is still widely practiced in Yemen, although terrace agriculture is normally categorized as *rain-fed*.

In the past, grains, particularly sorghum grown for subsistence use, accounted for most of the cultivated area and crop volume in the rain-fed areas. The exception to this were a few crops like coffee and grapes that were grown on terraces or in the more reliable spring- and spate-irrigation areas. This pattern changed dramatically beginning in the 1970s, however, as the use of tube wells became common. Tube wells were made possible by modern drilling equipment in combination with investment funds from wealthier farmers and worker remittances and from government and international donor programs.

The extent to which well irrigation changed the character of Yemen's agriculture is seen by comparing how the cropping pattern has changed along with the proportion of area under irrigation, as shown in Table 3.1.

Table 3.1 Comparison of Yemen's Cropped Area by Water Source and Crop Category, 1970, 1996, and 2002

	Area (1,000 ha)	% of Area	Area (1,000 ha)	% of Area	Area (1,000 ha)	% of Area
Total cropped area	1,266	100	1,155	100	1,133	100
—by water source:						
Rain-fed	1,056	83	579	50	529	47
Spate	120	9	100	9	129	11
Spring	73	6	20	2	41	4
Well	37	3	368	32	434	38
—by crop category:						
Cereals	1,082	85	704	61	593	52
Qat	8	1	91	8	110	10
Fruits and Vegetables	39	3	136	12	97	9
Fodder	40	3	94	8	115	10
Other	97	8	130	11	218	19

Source: 1970 and 1996 figures based on World Bank, *Republic of Yemen, Agricultural Strategy Note* (1999). 2002 figures from MAI, *Agricultural Statistical Yearbook, 2002*. It is assumed that the 1970 figures do not include the Democratic Republic of Yemen.

¹⁰Spate irrigation is a traditional form of water harvesting in which streams flooded from downpours in distant mountains are diverted for crop use. The word *spate* stems from the British English usage that refers to a sudden flood or freshet. Spate irrigation depends on diversion of highly intermittent streams.

As Table 3.1 demonstrates, over the past three decades the proportion of total cultivated area irrigated by wells increased from 3% to 38%, while the proportion that is rain-fed declined from 83% to 37%. This was accompanied by a dramatic drop in the proportion of area devoted to cereals (85%–52%) and increases in fruits and vegetables (3–9%), *qat* (1–10%), and fodder crops (3–10%). The increase in cultivation of *qat* has been even more dramatic than in fruits, vegetables, and fodder crops.

The shift to well irrigation caused significant changes in Yemen's agricultural trade balance. From being a net importer of fruits, vegetables, and fish in the 1970s and 1980s, the country attained net exports in all of these categories by 2000. Furthermore, while it is still a net importer of livestock products, the country's trade balance in these products has improved significantly during the past two decades, reflecting the greater emphasis on fodder crop production. These improvements notwithstanding, Yemen's dependence on imports for grains and other food crop products has increased dramatically. Although 42% of grains (mostly wheat) were imported during the 1980–1981 biennium, 80% were imported in 2000–2001. Imports of pulses (beans, lentils, etc.) increased from 3% to 42% of the total supply during the same period (see Table 3.2).

Table 3.2 Yemen's Balance of Trade in Principal Crop and Livestock Product Categories

Net Trade Volume as Proportion of Total Food Supply (%)			
Products	1980–1981	1990–1991	2000–2001
CROP:			
Cereals	-42	-71	-80
Starchy Roots	-3	-2	-1
Sugar & Sweeteners	-100	-100	-100
Pulses	-3	-18	-42
Oilcrops	-52	-68	-55
Vegetable Oils	-77	-93	-93
Vegetables	-11	-4	+2
Fruits	-48	-13	+2
ANIMAL:			
Meat	-41	-13	-23
Offals	-4	-1	0
Animal Fats	-69	-13	-21
Milk (excluding butter)	-73	-64	-58
Eggs	-49	-14	-19
Fish, Seafood	-4	0	+18

Source: FAO Food Balance Sheets (see Annex 5).

Note: Minus sign signifies net imports, positive sign net exports.

Yemen has long been a significant net importer of agricultural products. Faced with its significant population growth, the net import bill (imports minus exports) has increased somewhat through time (see Table 3.3). Without the shift to irrigated crops and the resulting fruit and vegetable export surpluses, increases in the food import bill would probably have been greater.

**Table 3.3 Yemen's Net Agricultural Import Costs
(Value of Imports Minus Exports, All Agricultural Products—US \$ Millions)**

Year(s)	1979–1981 (avg.)	1989–1991 (avg.)	1996	1997	1998	1999	2000	2001
Net Imports	685.3	635.6	1,132.2	595.9	699.5	717.3	735.8	769.8

Source: FAOSTAT, Yemen Food and Agriculture Indicators.

Tables 3.2 and 3.3 are based on official trade data. The data do not capture informal exports (smuggling) of livestock, *qat*, and other commodities to neighboring countries, particularly Saudi Arabia. Imports of some foods and other agricultural products are also smuggled. It is difficult to say what the net effect may be on the balance of trade.

3.1.2 Irrigation, water, and agricultural policy

Over the past decade it has become clear that Yemen's shift to reliance on groundwater irrigation is not sustainable. The country's limited groundwater supplies are being depleted. In some regions, such as Sa'ada Governorate in the north and in areas near Sana'a in the west central highlands, this is occurring quite rapidly. Water tables are receding at the rates of 2–5 m or more per year. In some areas, as the levels drop the water is becoming saline.

A review of government policies helps explain how groundwater use developed to the extent that it has. Beginning in the 1970s and continuing through the early 1990s, the GOY promoted groundwater irrigation, often with support from donor programs. Subsidized credit was used to support the construction of wells, and in some cases direct subsidies were used to pay for private well construction. Price subsidies on diesel fuel made it cheap to pump water. Further encouragement was provided by bans on fruit, vegetable, and *qat* imports.

Groundwater is treated as an open-access resource: anybody with the money or government support to drill a well was allowed to extract groundwater. Without recognized resource ownership, the individual user has no incentive to conserve water.

Nevertheless, the GOY and users have become aware of the problem. In 1996 the National Water Resources Authority (NWRA) was created to develop a regulatory and planning framework for improved water resources management. The government has also begun to adjust the distorted incentive framework that has driven the mining of groundwater. Diesel fuel prices have been increased in several steps, from YRIs 3 per liter in 1995 to YRIs 17 per liter in 2003. Nevertheless, at the equivalent of US \$0.09 per liter, this is still very cheap in comparison with the prices charged in most countries

Despite these changes, wells are still being dug and new land is being developed for groundwater irrigation, as the increase in well-irrigation area in Table 3.1 demonstrates. In some cases, the GOY is still providing assistance for establishment of privately owned wells.

The efficiency of groundwater use could be greatly improved by the introduction of drip irrigation to replace common but inefficient surface flooding methods, and by replacing open ditch conveyance with closed piping. The GOY, with donor assistance, has begun to provide subsi-

dized credit and grants for equipment of this nature. Such changes, if properly executed, could be expected to reduce water use by 30–40% or more.¹¹

In addition to its support of groundwater development, Yemen has invested heavily in the expansion and modernization of spate irrigation systems. As a result, the efficiency of some spate systems has been greatly augmented. Nevertheless, the increase in the total spate area has not been very significant (Table 3.1). Unfortunately, the GOY has shouldered the whole responsibility of developing and running these schemes. Water has been delivered at no cost to farmers. With recent declines in government budgets, it has not been possible to maintain them properly, and some have been badly eroded by seasonal floods. One of the reforms identified under the Aden Agenda (see section 2) is to assign responsibility for M&O of spate systems to local water user groups.

Despite the attention that has been paid to the irrigated crop sector, productivity in this sector is still comparatively low. A recent comparison by the World Bank shows that yields of potatoes, tomatoes, and bananas in Yemen are about half of what is obtained under similar circumstances in other countries, and citrus yields are only 10–20% of what is attained elsewhere.¹² These low yields reflect not only a failure to identify and disseminate quality genetic materials, but also an absence of extension advice and information on use of appropriate inputs.

Marketing of irrigated crops (especially fruits and vegetables) in Yemen is very weak. First, post-harvest handling procedures are highly deficient. The World Bank study noted above reports that such losses range from 10–40% for potatoes, 45% for tomatoes, 15% for grapes, 38% for bananas, and 56% for papaya. Closely related to this are shortcomings in the fruit and vegetable packing and grading systems, which prevent many of these products from meeting the standards of potential buyers for export. Consequently, the producer fails to gain potential income, and valuable foreign exchange earnings are lost to the economy.

A paucity of market information is widespread in Yemen, which adds particularly to producers' difficulties in dealing with the sharp price drops caused by seasonal market surpluses of perishable fruits and vegetables. A new EU-funded program for improving the market information system in the MAI has set out to address this problem by collecting and broadcasting price information in markets for many parts of the country.

3.1.3 Neglect of rain-fed irrigation and small-scale livestock production

As Table 3.1 shows, the rapid increase in groundwater irrigation has been paralleled by a decline in rain-fed crop area and production. Yemen's rain-fed crop area declined from 1.06 million ha to 529,000 ha between 1970 and 2002. At some point in the not-too-distant future, however, this downward trend is likely to stop as limitations in groundwater irrigation cause farmers to turn back to rain-fed crop production due to its greater sustainability.

¹¹Surface flooding is often only 30–50% efficient, depending on soil characteristics and the irrigator's management skills. Drip irrigation can be 80–90% efficient if well designed and managed. Although conveyance losses depend on the length of the conveyance and the type of soil, it is not uncommon to achieve savings of 10–20% or more by use of closed piping.

¹²See World Bank, *Yemen Agricultural Strategy Note*, 1999, p. 9.

Government policy is at least partly responsible for the decline in rain-fed systems, which have been ignored almost entirely by research and extension. Although this problem was identified for correction during the Aden Agenda process in the late 1990s, it has yet to be properly addressed.

In contrast to the import barriers that long sheltered fruit and vegetable producers, cereal production was forced to compete with large imports and government subsidies that, at one point, caused prices to fall to just 19% of international equivalent prices. Since this low point was reached in 1995, the GOY has taken measures to bring the price more into line with international costs.

Agricultural research, carried out primarily through the AREA, has focused on irrigated agriculture to the neglect of rain-fed crops. Most of the varieties used in rain-fed areas are local “land races” that are highly adapted to the limited and unpredictable availability of moisture. Yields of such varieties are typically very low. AREA officials state that some of the improved, locally selected seeds they have developed for wheat, barley, sorghum, and legumes would be higher yielding than the local varieties that farmers use, but the system for multiplying these seeds and getting them into farmers’ hands is weak.

The GSMC, a parastatal company that falls under MAI supervision, is charged with multiplication and distribution of seeds for the basic grains. GSMC attempts to market its seed directly to farmers, as well as through cooperatives and the General Agricultural Services Corporation (GASC). Since the number of GSMC branch offices is limited, and because cooperatives and the GASC are not well represented in many of the rain-fed areas, the seed marketing system does not work well in these areas. GSMC has not attempted to develop distributor relationships with private dealers.

In addition to the limitations of the genetic research and seed multiplication process, the agricultural extension system has not directed its attention to rain-fed areas, and its general weaknesses (see section 2) have meant that farmers have had no way to learn about any improved seeds that may have been available.

Another problem in rain-fed areas is that traditional terrace systems have deteriorated badly in some areas owing to lack of maintenance; some terraced fields have been abandoned. Government development projects have focused mainly on land and water development in the plains and the lower catchments. These projects overlooked the needs of the poorer rain-fed systems in the upper ends of the catchments.

Production of livestock, particularly sheep and goats, is the stable, sustainable base for the poorer and marginal farms, and it is the mainstay of rural women farmers. Livestock production based on range grazing is possible in areas where rainfall is too limited for reliable crop production. Furthermore, rain-fed crops that fail still provide some forage for livestock. Rural families in Yemen raise livestock both to generate income and to reduce the risk of not being able to meet a family’s needs at times of calamity.

Smallholder livestock production suffers from severe constraints on forage and feed availability and from widespread animal diseases. Despite increased production of forage crops, forage is

still scarce and expensive during many parts of the year. Most range lands are severely overgrazed, and there are no programs for helping local tribal or community groups establish appropriate management practices.

The GOY, with considerable donor assistance, has attempted to address livestock disease with vaccination programs run by rural veterinary service centers, but these programs did not achieve full coverage and have now become largely inactive.

While some genetically improved animals have been developed by the AREA, there is no effective program to make such animals available to producers at the local level. Yemeni poultry and dairy producers have demonstrated that imported feed grains and supplements can be used to overcome constraints in feed availability for their animals, but there has been no technical research or economic evaluation to verify that imported feeds could be used to overcome feed constraints for sheep and goats that now rely primarily on range grazing.

3.1.4 Agribusiness

Yemen's agribusiness sector, while still not large or diverse, has expanded significantly during the past decade. Growth of private agribusiness has been stimulated by the GOY's shift away from reliance on public sector service companies and its adoption of a more market-oriented approach that began in the early 1990s. The stimulus of private companies has been augmented by the more recent restructuring of MAI (see section 2) and by resulting legislation, such as the Seed and Fertilizer law, that provides the assurances of the private sector's right to operate in areas previously reserved for government companies. These shifts in policy have been accompanied by an expanded surplus of fruits and vegetables, which has provided opportunities for private sector exporters.

Although the GOY has eliminated many of the market distortions that were formerly caused by bans on trade, import licensing quotas, heavy tariffs, and farm input subsidies, some problems still persist. Agricultural cooperatives proudly state that they are "private" and "independent from the government," yet many continue to receive subsidized loans and grants from the AFPPF.

Although it now appears to be placed clearly on the list of MAI agencies slated for privatization, the GASC has, until recently, continued to distribute subsidized inputs. These have served as disincentives for the private sector and have impeded its development.

The GOY appears to have decided that it will not privatize the GSMC, which is responsible for production¹³ and marketing seeds for all of the main food grains. Seeds sold by the GSMC are heavily subsidized, which serves as a disincentive to private seed companies. The GSMC distributes through five branch centers as well as through the GASC and the cooperatives. This limits the availability of GSMC seed for farmers in many areas.

The private agribusiness sector

Yemen has several well-organized, multiproduct, and multiservice agribusiness companies that are vertically integrated. Some of these center their activities in the Hodeidah area, which is one

¹³The GASC decides what is to be produced and then contracts the growing of the certified seed to private farmers.

of Yemen's main port facilities. Others are headquartered in Sana'a or Taiz. Some also own facilities and operate in neighboring countries such as Saudi Arabia, UAE, and Egypt.

Several of these companies are export oriented and are involved in the production and marketing of coffee, fruits (bananas, mangos, oranges, grapes), and vegetables (tomatoes, okra, onions). Some export for marketing or further processing into juices and paste at their own outlets in other countries.

The relatively few commercial dairy producers are vertically integrated, from production and processing through distribution of their products in markets throughout the country. Their operations are based on a combination of production from their own dairy herds and use of imported, reconstituted milk powder. The corn, soybean meal, and concentrates used to feed their herds are imported. The majority of the milk production is processed into yogurt and butter that are distributed to major cities and larger towns throughout the country. Fresh milk is refrigerated and distributed through company-owned and private stores. Some commercial dairies reported that they do not pasteurize because of the uncertain electrical power. Spoilage of milk because of electric power interruptions, and because store owners turn off power overnight, are a common marketing problem. The dairies will import powdered milk to keep up with the milk demand in Yemen.

The poultry industry is one of the most significant and concentrated agribusinesses in Yemen. This industry is completely vertically integrated. Producers import all the feed ingredients (corn, soybean meal, and concentrates) and process nutritionally balanced feed rations in company-owned feed mills, with trained company technicians. A majority of these producers have large hatching capabilities, allowing them to market broiler and laying hen stock to poultry farmers across the country. They also have their own production units that raise broilers and eggs for market throughout Yemen. These companies also import day-old chicks to supplement local production and to supply smaller poultry farmers. Such producers have their own staff veterinarian, not only for the company but also to provide veterinary services for the independent farmer clients. They will also provide credit to client poultry producers.

Input supply companies account for the largest number of private agribusinesses in Yemen. Input supplies fall into three categories: (1) commercial seed; (2) agricultural chemicals, consisting of fertilizers, insecticides, fungicides, and herbicides; and (3) veterinarian supplies and medicine. The largest concentration of input suppliers is in Sana'a. They distribute products and services through company representatives, private agents, and retailers located in major towns throughout all five governorates. Some of the input companies also provide credit for their agents and retail stores.

The private sector now provides most of the chemical inputs used by farmers in Yemen, with the exception of bulk fertilizers (N, P, & K), where the market has been distorted by subsidized distribution through the GASC and the cooperatives.

Several larger input suppliers provide private extension services to support the products they sell. These services give guidance on proper seed selection, planting procedures, selection of chemi-

cals, and appropriate application procedures. Veterinary medicine suppliers often provide advice on identification of disease and proper medication, particularly in the poultry sector.

Input supply companies upgrade their technical support through workshops, where they train their representatives, agents, and farm customers. Some workshops have been organized through the Yemen Association for Traders of Agricultural Materials and have involved personnel from several member companies. The Association also works to provide public information on farm chemicals, and it serves as a lobbying group for the industry.

Owing to their private for-profit orientation, the agribusinesses must limit these “extension services” to those who can afford to pay or who are customers. The poor small farmer, out in villages away from major roads, does not benefit from these services.

The constraints faced by private sector agribusinesses are:

- Slow, cumbersome licensing process makes importing difficult and slow.
- Lack of qualified laboratories for plant and livestock disease control.
- Difficulty in obtaining consistent supply of agricultural products from the farmer.
- Inadequate quality control procedures and standards for fruit and vegetable production and handling.
- Shortage of good secondary roads.

These constraints represent areas that the private sector must work around in order to do business. Many of these constraints add extra costs and time to the marketing process, which forces some agribusinesses to resort to sale of contraband (smuggled) products of poor quality, many of which are “counterfeit” or cheap imitations of international brand name products.

Agricultural cooperatives

The cooperative sector consists of some 400 separate farmer associations, which come together at the national level under the ACU. The ACU has a headquarters’ staff that supports member associations with organization, training, assistance in management, and help in obtaining finance.

Some of the member associations are general-purpose cooperatives, designed to supply a range of inputs for multiple crops, while others are designed to serve more specific needs, such as supply feeds and baby chicks for poultry producers. Some provisions have been made to include women in the cooperatives, or to form separate women’s cooperatives, but much remains to be done.

Cooperatives are uneven in their coverage of rural areas in Yemen. In some governorates, there are cooperatives in most districts, while other governorates have only one or two cooperative associations. The operating capabilities of the associations also vary substantially, reflecting the abilities of leaders and managers, and the length of time they have been established.

Where they exist and function properly, cooperatives offer the potential to provide improved inputs, crop marketing support, and information to small farmers who cannot be easily reached by private sector agribusiness. To serve poor farmers in remote areas, however, the cooperatives are

likely to require outside support. The challenge will be to provide such support in a way that does not act as a disincentive to the private sector.

3.1.5 Agricultural credit and finance

The lack of finance for the agricultural and agribusiness sector in Yemen is one of the principal constraints to development of the sector. Most small farmers have no access to credit from formal financial intermediaries; CACB financing, one of the few lines of credit to which they might have access, is devoted almost exclusively to export financing. Small farmers tend to rely instead on retained earnings, remittances from family members, and informal intermediaries for financing. Agro-processors and agricultural cooperatives may rely on a variety of financing sources, including both private and public financial intermediaries. But subsidized credits and grants, provided by public financial intermediaries, limit the entry of private financial intermediaries into the sector.

Two semi-autonomous public financial intermediaries, the CACB and the AFPPF, make directed credits and grants for project financing in the agricultural sector. Both provide financing to private sector clients with a substantial subsidy, as compared with lending rates and terms available from private intermediaries, and their financing is directed to beneficiaries according to non-market—and frequently nontransparent—criteria. Both institutions have serious problems with nonperforming loans within their portfolios, representing a further effective subsidy to their agricultural sector clients.

The Agricultural Credit Bank

The CACB was set up as a public sector rural development bank, alongside two other “specialized” banks in Yemen, which were designed to direct credits in the housing and industrial sectors. All were effectively bankrupt by the mid-1990s, when a series of studies was carried out (by the World Bank, the international accounting firm KPMG, and others) to determine how they should be restructured or phased out. In 1998 an outside assessment concluded that the two specialized banks for housing and industry should be eliminated and the CACB restructured. The problems to be addressed included overstaffing, poor management, low loan recovery rates, and undercapitalization. The restructuring process was to commence in 2000. In 2002 a consultant was hired with Dutch assistance to make concrete recommendations as to how to proceed, but the quality of the consultant was called into question, and meanwhile Dutch assistance suffered from Yemen’s unilateral cuts. The core issue is that the Dutch consultant and other advisers want the CACB to operate on commercial banking principles, whereas the Yemenis want to continue with the concept of a specialized bank.

The CACB has a substantial network of branches—32, with at least 1 in every governorate—and extended credits totaling 1.2 billion rials (\$7.3 million) in 2002, largely in support of the export of agricultural products. It takes no deposits, other than of state funds, and thus it is not really a financial intermediary. It charges an effective interest rate of between 10% and 12% on its loans (as compared with 23% for commercial loans). It is not allowed to make loans representing more than 10% of its base capital, meaning that its loan size limit is around 30 million rials (less than \$170,000).

The bank does not follow central bank guidelines for reporting of nonperforming loans. However, it does charge a fee of 4% on the outstanding balance in case of loan default. The Assessment Team was told that between 25% and 30% of its borrowers were paying the 4% fee, and that larger borrowers were less likely to repay their loans than smaller borrowers, and that the worst repayment rates were by borrowers from Al-Jawf and Marib governorates.

The Agriculture and Fisheries Fund

The AFPPF serves four sectors: agriculture, fisheries, water resources, and local administration. It derives its financing from a tax on the sale of diesel fuel, representing an annual budget of around 4.2 billion rials (nearly \$24 million). It has four procedures for project financing. First, it provides grants, mainly to ministries. Second, it provides semi-grants to both cooperatives and ministries, with community participation. This latter procedure provides financing for poverty alleviation, water structures, and agricultural inputs.

The third procedure is a non-interest-revolving facility providing funds on a yearly basis to parastatals (e.g., public agriculture service organizations, fisheries organizations) for the purchase of inputs. The procurement of the inputs is competitive and arranged by the AFPPF. Finally, the AFPPF provides credits, mainly to cooperatives but also to a few private companies, for productive infrastructure (e.g., markets, export centers, ice plants). These credits are provided at no interest, but the borrower has to pay a 2% fee. The credits may be quite substantial in size, and repayment rates are low, making it virtually a grants program. AFPPF staff said that the cooperatives looked at these funds as their “own funds,” and hence did not see any need to repay them.

Under the 2000 Law on Local Governments, 30% of the revenues from the diesel tax are supposed to be directed to the governorates and local councils, but it is unclear how or whether this mandate is fulfilled.

AFPPF staff told the Assessment Team that their concern is on water availability over the long term, because most aquifers are being overpumped, according to the MWE’s studies. But there is very little capacity within the Fund, and less within the ministries, to evaluate and prioritize the project proposals it receives on an economic and environmental basis. Ministries, governorates, cooperatives, and the private sector are supposed to prepare and prioritize their projects for AFPPF review, but they evidence almost no capacity for feasibility analysis—from engineering and market studies to analysis of financial sensitivity to project delays, cost overruns, hydrology shocks, price shocks, and so on.

CACB staff told the Assessment Team that the bank’s loan-size limit puts it at a disadvantage in competing for clients with the AFPPF, which has no lending limits. So does the fact that the AFPPF provides either grants or no-interest loans, whereas the bank must charge at least some interest on its loans. This is almost certainly the case. It is also illustrative, however, of the fact that the presence of these two public intermediaries in the financial markets in Yemen has effectively stifled the development of commercial bank and other private financial intermediation to the agricultural sector.

The Social Fund for Development

The Social Fund for Development (SFD), established in 1997, was funded by the World Bank, the United States, and a number of other international donors. The SFD is a key component in the social safety net that was set up by the international financial institutions to help the poor cope with the shocks created by the GOY's structural adjustment program.

The SFD provides funding for basic community service infrastructure and for income-generating projects in all governorates. It operates at the district level and has a certain proportion of its funding designated for each district, according to an index of need.

District councils apply for projects, and the SFD hires independent technical specialists to evaluate them according to established criteria stated in its project manual. Projects that are selected are contracted by the SFD and then supervised by its consultants.

The communities that receive these projects are required to contribute a certain amount (typically, 5–10% of total project value) of their own resources, which normally is either their own labor or local building materials.

A few SFD projects have supplied water for agriculture, such as establishment or improvement of spate irrigation facilities. The SFD also provides small reservoirs and cisterns to collect runoff, a number of which have been joint purpose for both irrigation and domestic water.

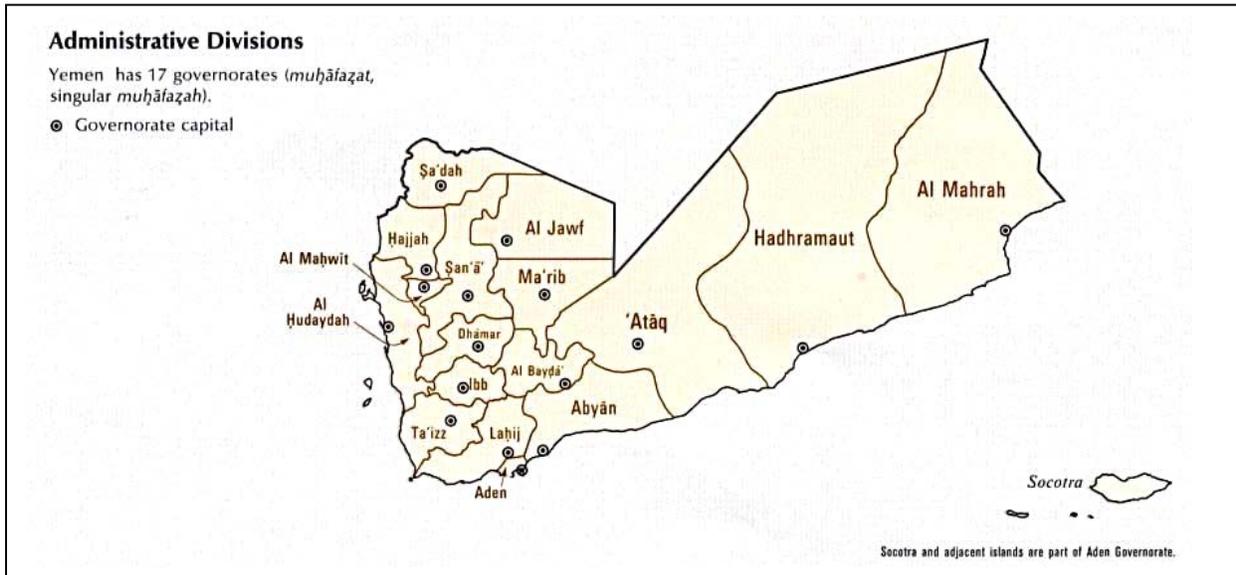
The only new water projects that the SFD supports are based on water harvesting of various kinds. SFD's policy is not to fund any well projects because they are not sustainable; however, it will support piping and canal lining to make existing well systems more efficient.

The SFD also has a micro-credit component to support small income-generating activities. It is not known whether such activities have been established in any of the five governorates, but they represent a potential source of credit for farmers and herders in this area, and they are set up to be amenable to women's needs.

3.2 CURRENT SITUATION AND CONSTRAINTS IN THE FIVE GOVERNORATES

USAID has chosen to focus its agricultural support on poor farmers living mainly in rain-fed areas of five governorates: Sa'ada, Amran, Marib, Al-Jawf, and Shabwa (see Map 1). This map is somewhat outdated. Amran Governorate is the northern half of what was formerly Sana'a Governorate in this map. Ataq is the Capital of Shabwa Governorate.

Map 1. Governorates of Yemen



3.2.1 Characteristics of the governorates

The predominate feature of these governorates is their relatively low and unpredictable rainfall. With the exception of narrow mountainous bands along the western edges of Sa'ada and Amran, and limited mountain areas in the south of Shabwa, rainfall is reported to be less than 125 mm (5 in.) per year. The eastern third of Marib and Al-Jawf and the northern half of Shabwa lie in the Rub Al Khali Desert, where it does not rain at all in some years.

The AREA classifies the drier areas as suitable for a combination of *pastoral* and *spate* farming systems. Rainfall is generally so low in these zones that crop production is not possible, and range grazing provides the only viable pursuit. Despite the low rainfall, diversion of wadi floods is possible in certain locales, and spate irrigation thus permits some crop production. Where precipitation reaches 400–450 mm (16–18 in.) in mountainous zones, *rain-fed* (or *dryland*) cropping is possible.

Since the rainfall is generally lower in these rain-fed crop zones than it is in regions such as Ta'iiz and Ibb, the yields of rain-fed crops here are expected to be less. However, separate data on rain-fed areas are not available to document this precisely.

Well irrigation has been developed in the valley floors of all of these governorates. Well users in Sa'ada, Amran, and Marib all report serious problems with declining water tables.

They have been forced to deepen wells further and further to obtain water. Some new wells in Marib are being drilled to 300 m to reach water. Farmers in Amran and Sa'ada are pumping from similar or slightly shallower depths. Smaller farmers who do not have the funds to deepen their wells run out of water. Saline is being encountered as wells are deepened, and it is killing trees in some citrus plantings.

Well-permitting regulations are not being followed in many cases, and new areas are still being developed for irrigation while water levels are dropping. Some new agricultural wells are still being constructed with government funding, despite declining water tables.

Populations and agricultural characteristics of the five governorates are summarized in Table 3.4, which demonstrates that:

- Amran is the most populous of the five governorates, with a population slightly greater than one million. Marib is the least populated, with some 241,000.
- Shabwa and Amran both have very small farm size (cultivated area per farm family), whereas the average size in Marib and Al-Jawf is much higher than average.
- Al-Jawf, Marib, and Shabwa all currently depend on well irrigation for a high proportion of their cropped area. This suggests that these governorates will be the most hard hit when their groundwater is exhausted.
- Except Amran, these governorates all have significant livestock holdings, indicated by herd size (animals per farm family) that are much higher than the national average. Sheep and goats make up a very large proportion of the herds. Al-Jawf and Shabwa have the largest average herd sizes.

Indicators of economic and social development for these governorates were obtained from the latest UNDP *Yemen Human Development Report*. These indicators are summarized in Table 3.5. These features stand out:

- The governorates are average to well below the national average in income levels (GDP per capita) and overall HDIs.
- Except Shabwa, all have very limited access to safe drinking water.
- All of the governorates have very low levels of adult literacy.
- Gender gaps are all more pronounced than for Yemen as a whole. Compared with men, women are very disadvantaged in literacy. And female school enrollment is still low, particularly at the secondary school level.

3.2.2 Problems reported by farmers and herders in these governorates

Yemeni members of the Assessment Team visited all five of these governorates, and international team members visited three. On these visits, farmers, agribusinessmen, and local officials were interviewed. Focus group discussions were held with female farmers, male farmers, and local leaders (see Annex 6). Information about various characteristics of the agricultural sector was obtained. The Yemeni Assessment Team compiled their findings in summary form for each governorate (Annex 7).¹⁴

¹⁴The analysis in this section also benefited from technical papers prepared by Eng. Jamil Al-Ba'adani and Eng. Sultan Abdulkarim Murshed. Copies of these papers are provided in Annex 8.

Table 3.4 Agricultural Characteristics of the Five Governorates, 2002

Governorate	No. of holdings (farm families)	% of holdings (farm families)	Population (2002)	% of Total National Population	Rural Population (2002)	% of Rural Population	Cultivated Area (ha)	% of National Cultivated Area	Average Area per Holding (ha)
Sa'ada	41,276	3.7	633,872	3.3	554,359	87.5	55,221	5	1.3
Amran	75,500	6.8	1,033,264	5.3	894,467	86.6	70,755	6	0.9
Al-Jawf	10,564	0.9	461,436	2.4	403,191	87.4	48,185	4	4.6
Mareb	14,488	1.3	241,231	1.2	212,058	87.9	79,134	7	5.5
Shabwa	25,843	2.3	484,390	2.5	428,462	88.5	9,932	1	0.4
Yemen Overall	1,115,515	100.0	19,494,999	100.0	14,279,088	73.2	1,132,910	100	1.0
Governorate	% of Area Cultivated, by Water Source				Herd Size—No. of Animals per Farm Family				
	Rain-fed	Spate	Spring	Wells	Sheep	Goats	Cattle	Camels	Total Herd
Sa'ada	49	9	10	29	12	8	1.9	0.1	22
Amran	n.a.	n.a.	n.a.	n.a.	8	5	0.6	0.0	13
Al-Jawf	2	26	17	55	33	21	1.7	1.1	56
Mareb	14	37	0	63	15	14	0.3	0.8	31
Shabwa	0	37	0	53	20	27	0.1	0.8	48
Yemen Overall	47	11	4	38	6	6	1.2	0.2	14

Source: GOY,CSO, Yemen Statistics Yearbook 2002; MAI, Agricultural Statistics, 2002; and ARD Field Survey (see Annex 7).

Table 3.5 Human Development Indicators for the Five Governorates, 2000

Governorate	Indicators for Overall Population					Gender Gaps (Female as % of Male)			
	Life Expectancy (years)	Adult Literacy Rate (15+) (%)	Real GDP per capita PPP \$	HDI	Access to Safe Drinking Water (%)	Life Expectancy at Birth	Literacy Rate (15+) (%)	Basic Education Enrollment Rate (%)	Secondary Education Enrollment Rate (%)
Sa'ada	62.2	34.6	802	0.439	18	1.1	16.3	26.0	9.5
Amran	n.a.	43.8	802	n.a.	20	n.a.	22.8	35.3	15.3
Al-Jawf	67.1	28.2	545	0.412	4	0.9	26.2	48.9	24.6
Mareb	64.6	45.3	770	0.497	33	1.0	27.9	54.9	20.5
Shabwa	64.3	45.4	698	0.481	53	1.0	23.2	38.4	1.5
Yemen Overall	61.1	47.3	790	0.489	36	1.06	38.5	52.8	35.3

Source: UNDP, Yemen Human Development Report 2000/2001.

The problems most commonly mentioned by farmers, female farmers, and leaders in these governorates were the following:

- *Absence of or weaknesses in agricultural extension and veterinary services.* Extension and veterinary agents are limited in what they can do because they have no transportation. Transport and logistic support for women's extension is very limited, particularly in Sa'ada, Aman, and Al-Jawf.
- *A shortage in availability of inputs.* This complaint often hinges on the fact that the local agricultural offices and services no longer distribute subsidized chemicals and veterinary medicines as they once did. It also reflects the difficulty faced by farmers and herders in remote districts, who must travel long distances to obtain inputs from private suppliers in more central districts.
- *Lack of credit.* Farmers in most of these governorates report that credit is simply not available from the CACB. They acknowledge that there have been repayment problems in the past.
- *Shortage of farm machinery and machinery services.* The local agricultural offices received equipment from past projects and offered custom services to local farmers, but much of this equipment has been worn out and not maintained or replaced. Private ownership of tractors and other equipment is still limited, and users complain that rates charged for custom work are high.
- *Plant disease problems.* There is lack of information and diagnosis, and materials for treatment are difficult to obtain.
- *Livestock suffers from scarcity of feeds and fodders; livestock disease problems are common.* These problems have been exacerbated over the past six years by exceptionally dry conditions that have reduced crop production and livestock populations.¹⁵ Rangelands are severely degraded, reflecting excessive livestock populations and absence of institutions for management of grazing.
- *Marketing problems, particularly the absence of markets capable of handling peak season fruit and vegetable production.* Three of these governorates have new wholesale markets that would help alleviate this problem, but they are not yet operational.
- *Periodic flooding* erodes wadi banks, which damages fields and spate irrigation facilities.
- *Desertification and sand encroachment* cause a loss of farm fields.
- *Tribal conflicts and rivalries* (particularly Al-Jawf and Marib, and to a lesser degree in Sa'ada and Shabwa) interfere with the operations of government services and cooperatives.

3.2.3 Who are the poor farmers in these governorates?

On the basis of its visits to these areas and particularly on the focus group discussions, the Assessment Team finds that:

- The poorer farmers in these governorates are those who depend mainly on rain-fed crops.
- The poorest of the poor are those with little or no crop land and who depend primarily on livestock. Many of these are semi-nomadic herders who live in tents or crude shelters. They are often located far from improved roads and are difficult to reach.
- Many families headed by women are also poor. These are either widows or women whose husbands are away working and do not make enough money to send much home.

¹⁵The Assessment Team was unable to verify that herd sizes have decreased, however. MAI livestock statistics suggest that area herds have actually increased during recent years, but these data are noticeably unreliable.

3.3 MAI'S MANAGEMENT SYSTEM AT THE LOCAL LEVEL

The presence of the MAI is reflected in varied ways across these five governorates. Four of the five governorates are served by the RADAs that are semi-autonomous but fall under the supervision of the MAI.

- Sa'ada and Amran come under the NRADA, which has its headquarters in Sana'a and offices in the two governorate capitals.
- ERADA has its headquarters in Marib and an office in Al-Jawf. A significant proportion of ERADA's staff are responsible for operating and maintaining the Marib Dam and reservoir.¹⁶

Shabwa has an Office of Agriculture located in Attaq, the governorate capital.

The organization of these entities differs. The staff of the development authorities are employed and paid by their authority but receive technical support and supervision from the MAI. The staff of the Office of Agriculture in Shabwa are employed and paid by the governorate, but budget for this is transferred from the MAI budget. The staff also come under the MAI for technical support and supervision.

All of these governorate-level agricultural entities have extension services, in addition to carrying out other activities such as design and construction of irrigation structures, control of soil erosion, and provision of veterinary service.

3.3.1 Agricultural extension

Although MAI-supported extension services are present in each of the governorates, they receive inadequate logistic support and have very limited operating budgets. They have few vehicles, and there is a shortage of funds to buy fuel.

Aside from offices in the governorate capitals, there are small extension centers in most districts, although they have very limited equipment and few have vehicles.

Extension appears to have fared poorly in competing for funds against services such as irrigation, which generates income from project planning and construction.

All five of the governorates have farms for extension field demonstrations. At least one of these (Amran) is not operating at all, whereas limited demonstrations are being carried out in other governorates.

Extension agents have had very little training during the past 6–10 years. Thus, many are poorly prepared to inform farmers on good practices or to help them address production problems that may arise. Many extension agents are high school graduates, and have had no formal training courses since they were hired.

Extension agents lack current technical brochures to provide to farmers. There is little if any audio-visual equipment, which would often be preferable to providing written material, given the relatively high rate of illiteracy in farm women and older farmers.

¹⁶Al-Jawf also has its own Office of Agriculture, with a small staff employed directly by the governorate. ERADA maintains a separate presence and a larger staff in an office that was built to manage a World Bank Project. There is a dispute over who should control these two offices. See Annex 7.

The lack of training for extension agents is a reflection of the failure of the extension system at the national level, specifically the fact that there is no entity within the MAI that is responsible for extension training or for overall coordination and supervision of extension.

Despite these limitations, the assessment team witnessed numerous cases where extension agents are working to support farmers and help provide them with needed information. They do manage to make some field visits, and a few field demonstrations are being carried out.

Reflecting the past policies of government and donors, extension agents and local agricultural officials still work mainly with irrigation farmers. They do not know many rain-fed crop farmers or range livestock producers, nor are they well prepared to meet the needs of these groups.

3.3.2 Veterinary services

Veterinary services are vital to livestock producers in the rain-fed and range areas. Livestock disease is widespread in all five governorates. Past campaigns through veterinary service centers were not successful in controlling them.

Veterinary services are offered through the agricultural offices of the RADAs and in the Shabwa Governorate. These services are separate from livestock extension. In some governorates, veterinary services are headed by veterinary doctors, and they are supported by a varying number of veterinary technicians.

Veterinary technicians are assigned to veterinary centers in some districts, but many of these centers no longer function, and operations in others are limited.

Veterinary services suffer from the same limitations in training, operating budget, equipment, transportation, and logistic support noted for extension.

Farmers with sick livestock often bring them to Sana'a, if they can find transportation. They must be at the clinic between 8:00 a.m. and 2:00 p.m. or they will not be seen. They claim that when they do see a technician, they seldom get an answer to their problem. As a result, they say they have lost faith in MAI veterinary services and now rely on the private sector veterinary technicians.

Formerly, the veterinary service distributed veterinary medicines gratis, or at subsidized prices. This was an incentive for herders to find ways to reach them with their problems. Now most medicines are sold by the private sector, but private vendors lack the training to know which medicines to recommend or to suggest other types of treatment.

3.3.3 Agricultural research

The Eastern Plateau Research Station of AREA is located in Marib. The station is charged with conducting research that addresses agricultural and livestock problems and needs of Marib, Al-Jawf, and upland parts of Shabwa governorates. The needs of Amran and Sa'ada are addressed through the Northern Highland Research Station in Al Irrah, located between Sana'a and Amran.

The AREA has an experimental farm in Amran, but it is inactive. Staff there are still in place and being paid, but they have not had budget to conduct research for the past two years.

The Marib station has a number of qualified professional staff, but conducts only limited research on topics relevant to rain-fed crops and livestock. Staff are available who have carried out socioeconomic studies used to help focus research.

There is an established working relationship between the branch station and the ERADA, which works jointly with the station in some of their farm trials.

Very little is being done to address range management problems in these governorates. There appear to be little or no research or developmental programs for improved forage varieties under rain-fed conditions. In some instances, these programs have been totally disregarded for over 10 years. The ERADA station has a range management scientist on staff, but it appears that he has not done any research.

3.3.4 Seed multiplication

The Eastern Region Branch of the GSMC is situated in Marib, where production of certified seed for the region is achieved by contracts with local seed growers. The Marib branch can also distribute seed obtained from other GSMC branches and facilities.

The Marib branch is also responsible for distribution to Al-Jawf, although it has no office there. Farmers in the other governorates are expected to obtain GSMC seed either through cooperatives or from other GSMC branch offices that are located at a considerable distance.

The varieties available through the Marib branch are reported to be of limited interest to rain-fed growers, particularly those in Al-Jawf.

The GSMC and its branches have the potential for multiplying and distributing seed that would help boost the yields of rain-fed crops in the five governorates. To realize this potential, it first needs improved seed varieties, which could be supplied by AREA, if its efforts are properly focused. The GSMC also needs to develop an active network of private dealers, which will require a substantial change in the orientation and management of the organization.

3.3.5 Natural resource projects

As noted above, these governorates all suffer in varying degree from depletion of groundwater, flood damage along wadi banks, rangeland degradation, desertification, and sand encroachment. Farmers and leaders in all of the governorates visited expressed needs for assistance in projects:

- New and improved spate irrigation diversion and conveyance systems.
- Community cisterns and small reservoirs, to collect run-off for domestic and irrigation use.
- Simple structures (*gabions*) to control erosion along wadi banks.
- Planting wind breaks to protect fields from desert encroachment (Marib and Al-Jawf).

These problems are being addressed by the Office of Agriculture in Shabwa and the local offices of the RADAs in the other four governorates. It appeared to the Assessment Team that there is

more funding for water and other natural resource projects than there is for extension and most other activities of these offices.

Under the current system of decentralization, projects are first proposed by local councils or individuals, and reviewed by the governorate administration. Those that are approved by the governorate are forwarded to the local agricultural offices for evaluation and prioritization, prior to submission for final evaluation by the DOI in MAI. Projects that are approved may be designed either by the DOI or by engineering staff in the local offices, under DOI oversight. Supervision of the local contractors who build these projects is normally carried out by local engineering staff. Funding for such projects comes either from the AFPPF or from MAI's capital budget.

Although a system to carry out such projects does function, it appears to suffer from a number of shortcomings:

- The process lacks transparency. The criteria used by the MAI/DOI for project selection are not clear. It is evident, however, that they do not pay enough attention to identifying and estimating economic benefits.
- Although local councils are responsible for initial project identification, they lack the technical capabilities and staff for doing this. This may explain why there is a shortage of good projects being requested at the local level.
- The process of budgeting projects to be constructed by the RADAs bypasses the MAI budget review process. Some funds are being used to construct new wells in areas where water tables are facing serious depletion. In some cases, it appears that such projects are constructed to the benefit of individuals rather than the community at large.

3.4 AVAILABILITY OF SUPPORTIVE INFRASTRUCTURE

The infrastructure available to support agricultural development in these governorates is summarized in Table 3.6.

Table 3.6 Availability of Infrastructure

Type of Infrastructure	Sa'ada	Amran	Al-Jawf	Marib	Shabwa
Roads, total (km):	1,268	675	107	1,083	696
Asphalt	506	190	14	576	523
Improved	762	485	93	507	173
Extension Centers	15	16	11	12	4
Extension Agents	n.a.	n.a.	38	33	34
Districts without Extension Center (of total districts)	2 of 15	4 of 20	3 of 12	2 of 14	13 of 17
Veterinary Centers	1	8	2	6	5
Veterinary Doctors or Technicians	1	12	4	5	7
Wholesale Markets*	1 (govt.)	3 (private)	0	1 (govt.)	1 (govt.)

*Market in Sa'ada was recently completed and is operating at low capacity; Marib market construction is complete but not operating due to generator problem; Shabwa market is still under construction.

Source: Most of this information was collected by the Assessment Team during their field visits. The information on number of extension agents and veterinarians was supplemented by AREA, *Agricultural Extension in Yemen*, Annex II, June 2002.

Road availability varies widely among the five governorates, although the numbers must be considered in light of population and area. Al-Jawf has less road coverage than the other four, and very little of its road distance is covered by asphalt. Amran is also limited in asphalt road coverage.

With the exception of Shabwah, most districts in these governorates have extension centers, while fewer of them have veterinary centers. Considering the importance of livestock, there are relatively few veterinary technicians in all of these governorates except Amran.

The wholesale markets that have recently been established in three of the five governorates have the potential to become valuable assets that can be used to help overcome the serious constraints in marketing that all of these areas face.

3.5 FARM PRODUCT MARKETING

3.5.1 Crop marketing

The markets in the five governorates are completely informal and fragmented, with no organizational structure or management.

The staple grains are produced both on rain-fed and irrigated farms, and they are grown mainly for subsistence use. Since Yemen and most rural areas are deficit in these grains, considerable quantities, especially wheat, are imported from abroad and distributed by agribusinesses and traders through local shops and in market stalls at the weekly *souks*.

Fruit and vegetable markets are highly fragmented and are derived almost exclusively from groundwater irrigation. Some of the production is traded locally, with a higher percentage being exported either to parts of Yemen or through the northern borders into Saudi Arabia.

Fruit and vegetable production and markets suffer from a number of serious problems, which in turn limit the benefits to farmers and—owing to multiplier effects—limit benefits to overall governorates and regional economies.

- There is no post-harvest handling system in place for fruit and vegetable production. Over 50% of the production is loss due to improper post-harvesting. There are no organized receiving or packaging facilities that segregate product by size or grade.
- Sanitary controls are also very deficient. For example, products such as oranges, apples, mangos, tomatoes, potatoes, and onions arrive at the local *souk*, piled in the back of a pick-up truck or in rusty containers. Many times the pick-up trucks have just hauled some sheep or goats to the market and had not cleaned out the bed of the truck. Handling systems, as described above, that permit segregating of product also make it possible to develop program for hygienic and food safety standards.
- There are no formal/organized receiving and distribution centers, except the recently constructed wholesale markets in Sa'ada and Marib and the market under construction in Shabwa (Table 3.6). These markets are provided with cooling, storing, and some grading facilities. **It is essential to note that these markets are not yet operational.**
- There is a total lack of market information systems, leaving local producers at an extreme disadvantage vis-à-vis traders. The lack of information contributes to the inability of planning and market timing by the growers, thus contributing to the severity of seasonal surpluses resulting in price drops.

Export potential. It must be emphasized that the considerable export potential of the fruits and vegetables in the five governorates is not being realized. This is largely due to the absence of modern packing and grading procedures, and problems with food safety and hygiene noted

above. It also reflects the absence of information about the Saudi markets, and a lack of familiarity with modern export procedures on the part of Yemeni traders.

Smuggling is a long-standing tradition in Yemen, and traders often find that it is simply easier just to smuggle goods than it is to see that they meet formal export standards.

Annex 9, Trade Policy and Agriculture, was prepared by one of the members of the Assessment Team. It discusses international trade in agricultural products, and provides insight into the ways that export markets in the five governorates can be improved.

3.5.2 Livestock marketing

As with crops, livestock markets are completely fragmented, with no formal structure or market information. The livestock market that is the current focus throughout the five governorates is for live sheep, goats, and cattle. These animals are often sold in the *souks* amidst the fruit and vegetable sellers or in back streets or a vacant lot in villages and towns. This leads to disorganized and unsanitary situations.

Livestock in these governorates represent a main source of income for the poorest of farmers, particularly women, who care for the poultry, sheep, goats, and dairy cows. These animals are the primary source of food and fiber (wool for weaving carpets), and they are sold according to family needs for cash—not according to market opportunities. Improved markets could help greatly to improve the income that producers derive from the animals they sell.

There are no animal holding facilities for producers who bring animals to these markets. Perceiving this, traders wait until the last possible minute, until producers have no alternative and are forced to sell the animals at low prices. The lack of a formal marketing center such as a sale barn or sale yard with holding pens leaves the producer at the mercy of these scalpers. The provision of sales barns with holding pens could greatly improve livestock marketing in these areas.

3.6 AGRIBUSINESS

3.6.1 The private sector

Private sector agribusinesses and input suppliers have expanded in the area, helped by stimulus from government reforms and market liberalization carried out in the 1990s.

Private sector agribusinesses are present in all five governorates, although in varying degrees. The informal and fragmented nature of the markets, as well as the cost of reaching them, limits private coverage. Road coverage is limited in many areas, and some districts are remote and difficult to reach. Potential market size in some districts is limited due either to limited population and/or low income. Particularly for the rain-fed grains, the farmer can afford few if any purchased inputs. The fact that the grains are produced mainly for home consumption means that crop marketing services are not required. Owing to these factors, the availability of production inputs and representation by the private sector are stronger in some of the governorates and districts than in others.

Table 3.7 shows distribution of private sector dealers and representatives. Most of these deal in a varying combination of farm chemical inputs, seeds, and veterinary supplies. The table demon-

strates that private agribusiness representation is much stronger in Sa'ada and Amran, which lie to the west, and is weakest in the three governorates lying to the east.

Table 3.7 Private Sector Representatives and Dealers

Governorate (capital city name if different from governorate)	No. of Representatives and Dealers in Governorate Capital District	No. of Reps./Dealers in Other Districts of the Governorate
Sa'ada	10	62 in 12 of 14
Amran	8	13 in 6 of 19
Al-Jawf (Al-Hazim)	2	1 out of 11
Marib	2	0 out of 13
Shabwa (Attaq)	2	0 out of 16

Source: ARD Assessment Team field studies, see Annex 7.

Seed. Private sector distributors provide the majority of hybrid vegetable seeds, fruit tree seedlings, and grain seeds. The quality of most seeds appears to be good, but most farmers do not conduct the necessary research and testing on their specific growing zones to maximize yields. Furthermore, farmers resist paying the higher prices commanded by hybrid seeds (maize, sorghum) and fail to realize that this expense is normally more than offset by higher yields and more disease resistance than local, open-pollinated seed varieties. Reluctance to incur costs and lack of education and understanding regarding the value of good hybrid or new open-pollinated variety seeds are the primary reasons most farmers continue to use their own saved or locally produced seed season after season. In time, such seed loses vigor, and production rates post sub-standard yields after the second and third seasons. This particularly affects vegetables such as onions, peas, beans, and okra; in time, it also impacts grains.

Chemical Inputs. Traders, agents, and retail farm stores within the private sector sell the majority of fertilizers, insecticides, fungicides, and herbicides to farmers. Those familiar with the market indicate that over 75% of the farm chemicals used are being smuggled into the country. Many of the traditional smuggling routes pass through within the five governorates, which makes them easily available to farmers at lower prices than legally imported, higher quality chemicals. In many instances the contraband chemicals are outdated, and some have been banned from use in other countries, due to unhealthy residual effects. Because of the lower prices, however, farmers are inclined to buy the smuggled products, even though they may be of lower quality and even dangerous.

Several private sector distributors told the Assessment Team that they have observed sickness in some villages that appears to be directly related to improper application and handling of farm chemicals. With the limited activity of the extension service, there is very little training for farmers on proper chemical selection, application, and handling techniques, or on the potential dangers of the contraband chemicals.

The legal importation of chemicals is a very slow and costly process, making the price of quality products imported by the private sector expensive for small farmers.

Veterinary Medicines. In view of the lack of veterinarians, veterinary medicine suppliers are called on to deal with extensive livestock disease problems through the supply and distribution of veterinarian medicines. A few of the most common diseases such as brucellosis, which reduces

sheep and goat production, and Newcastle disease have decimated poultry flocks. Parasitic infestation in all livestock is very common and reduces growth and production. Veterinary medicine dealers receive some training and information from their company headquarters and suppliers as to which medications to recommend and how to use them. Sometimes they also consult with government veterinarians and technicians. Dealers need more training. This is another area where they need to work with government extension and veterinary services.

It is difficult for herders in remote villages and range areas to reach either the limited number of government veterinarians with their sick animals, or to go to input shops for medicines and advice. The lack of vehicles is a serious constraint to producers, veterinarians, and input suppliers alike.

Commercial poultry companies provide veterinarian service for their own flocks and customers. This service is limited and does not address the major production units of livestock among the small farmers in these governorates. There are not enough qualified private veterinarians to provide the services needed in this sector.¹⁷ Unfortunately, most small farmers perceive veterinary medicine as unaffordable on their extremely limited income. The cost of medicine for some of the prevailing diseases will run 20–30% of the value of the animal to obtain a cure. Therefore, farmers will not purchase the medicine. Several private sector input suppliers have held workshops to educate farmers on the benefits of medicines, but these workshops are limited to a select few customers or potential customers.

Livestock production. Important livestock production principles have been largely overlooked in these governorates. Inbreeding of stock has become commonplace. Breeding is random and uncontrolled, resulting in undersized animals, poor lifetime production, and early mortality. There are also no culling strategies in place, which leads to nonproductive animals.

Housing for sheep, goats, and cattle is inadequate and inappropriate in most of the rural areas. The Team observed that livestock sheds are often makeshift arrangements, very small, unclean, and with little or no roofing to provide sun protection. This situation promotes the spread of animal diseases and thus limits animal productivity.

In its current weak status, the agricultural extension system does little to address these problems or to introduce improved management practices.

Feed and forage supplies. Irrigated forages such as alfalfa¹⁸ and sorghum produced under irrigation have become increasingly costly and less attractive as a source of fodder. Excess stocks from grain sorghum and millet raised in the coastal regions are being trucked 100–250 km into these governorates by traders during the winter months to supplement the lack of forage in the area. These stalks have poor nutritional value unless they can be used with a feed supplement. The few good-quality, nutritionally sound feed grains that are used by farmers are usually imported and distributed by traders into local retail shops in major towns.

¹⁷We have addressed this problem regarding extension service, and the MAI's lack of trained veterinarian technicians and qualified testing facilities.

¹⁸ Alfalfa provides high-protein feed but has very high water demand.

The private poultry and dairy industries have taken major steps toward establishing formal market structures. The poultry industry has been successful in addressing the lack of quality stock (chicks) and feeds by importing original chick stocks. Both the poultry and dairy industry use imported feed concentrates and supplements, which they then grind and mix at their own feed mills to produce a complete nutritional feed. This feed is limited to company-owned production units and customers who are raising livestock under informal contracts.

Several large agribusiness importers and poultry companies distribute feed concentrates and feed ingredients such as soybean meal, corn, and wheat bran in local markets through retail outlets. Farmers can then purchase and mix their own feed. However, most small- to medium-sized farmers are not educated as to proper mixing ratios and the benefits of a balanced and nutritional feed ration.

Most of these imported feed ingredients are not consistently available, and surface only in local markets when the commercial poultry or dairy industries find they have temporary surpluses. Thus, there is an inconsistent supply chain. Additionally, these feedstuffs do not address the needs of small farm livestock, such as mineral supplements and medicated concentrates for prevalent diseases and parasitic control.

Some poultry companies told the Assessment Team that they would be interested in producing and selling steady supplies of properly formulated feeds for sheep and goats, and that they think farmers would be interested in buying such feeds if they could be sure that they will work.

3.6.2 Agricultural cooperatives

Cooperatives exist in all of the five governorates, although their presence is particularly limited in Marib, Al-Jawf, and Shabwa.

Cooperatives appear to be strongest and most widely spread in Amran, where they exist in a majority of districts. The number of cooperatives is substantial in Sa'ada, but they are limited to just 2 of the 15 districts.

Some of these farmer associations are general-purpose producer cooperatives, while others are for special purposes such as providing specific supplies to greenhouse producers, feeds and equipment to poultry producers, and operating dairies.

The level of activity and capabilities of these cooperatives varies substantially. Some, such as the dairy cooperative near Amran, are very strong.

A general problem exists in hiring competent management. Many cooperatives suffer from the fact that managers are selected for local political considerations, rather than for their managerial abilities.

Cooperatives have been designated to operate new wholesale markets that have already been constructed by the MAI in Sa'ada and Marib, and one that is now under construction in Shabwa. All of three of the facilities have modern, well-designed cold storage facilities.

The market in Marib is not operating due to local political issues, and because of a problem with the refrigeration equipment. The national Agricultural Union has recently announced that it has assigned a cooperative from Dhamar to operate the Marib market, and that it will soon be repaired and put into operation.

The Sa'ada market has only recently begun to operate. The cold storage rooms are being used on a limited basis. This market also has a locally constructed packing line for fresh fruits and vegetables. The local manager is inexperienced and will need considerable support to make these facilities operational and productive.

3.7 UNIVERSITIES AND AGRICULTURAL EDUCATION

There are no universities or agricultural high schools in the five governorates. The Assessment Team was not able to identify any cases where university staff from other parts of Yemen are carrying out research or working in support of extension in these governorates. If properly oriented, universities could conduct useful applied research and help train extension staff to support rain-fed farmers and livestock producers.

3.8 SOURCES OF FINANCE AND CREDIT

Most credit obtained by farmers and herders in these governorates is informal. Often, credit is in the form of loans within a family or tribe. In-kind loans from input suppliers are said to be fairly common, or in some cases a trader will extend cash credit to a crop producer, who is then obligated to sell the crop. With the possible exception of family loans, it is doubtful that much of the informal credit is available to small farmers.

The **CACB** has branch offices in all five governorates, although the activities of these branches have been substantially reduced in recent years. The branch in Sa'ada has made only about 60 loans during the past year, and none of these were made to small farmers. The branch in Marib reported that only a few new loans had been made recently.

The current program of restructuring the CACB at the national level is aimed at making it operate more like a commercial bank, without subsidies. If it succeeds, this is unlikely to result in much credit for small farmers and herders. However, the bank's stated intention of operating like a commercial bank may result in increased availability of credit to private agribusiness companies, which could be helpful in stimulating agricultural development in the five governorates.

The **AFPPF** has been an important source of finance in the five governorates, providing funding to the MAI for construction of small dams and reservoirs and for wadi bank protection projects. The process through which these projects are proposed and selected was discussed above.

The **SFD** provides funding for basic community service infrastructure and for income-generating projects in all governorates. It operates at the district level and has a certain proportion of its funding designated for each district, according to an index of need.

The SFD also has a micro-credit component to support small income-generating activities. It is not known whether such activities have been established in any of the five governorates, but they

represent a potential source of credit farmers and herders in the five governorates, and would be particularly attractive for women.

3.9 SYNTHESIS OF FINDINGS AND PROGRAM OPPORTUNITIES

All of the targeted governorates depend heavily on irrigation of crops by wells. The continuance of well irrigation is threatened by declining water tables. Saline water and related soil quality problems are already damaging citrus and other trees in some districts. As groundwater supplies continue to diminish, farmers in these areas will need to learn to rely on rain-fed crops, as was the tradition in the past.

Rain-fed crop areas are devoted primarily to the food grains that are grown for subsistence purposes. Yields of sorghum and other grains are very low, and farmers have had little support from research and extension in increasing their production.

The other important productive resource that these areas will turn to as wells go out of production is livestock. Holdings of sheep and goats in these governorates are two to three times the national average herd size, but livestock production is constrained by critical shortages in feed and forage supplies. Range areas have been severely degraded by overgrazing. Livestock productivity is limited by serious and widespread animal diseases.

These governorates suffer from a variety of natural resource management problems, in addition to growing water scarcity and degraded grazing areas. Soil erosion along wadi banks, due to flooding, is a problem in most areas, and desert encroachment is serious in Marib and Al-Jawf.

Who are the poor farmers? The poorer farmers in these governorates are those who depend mainly on rain-fed crops. The poorest of the poor are those with little or no crop land and who depend primarily on livestock. Many of these are semi-nomadic herders who live in tents or crude shelters. They are often located far from improved roads and are difficult to reach. Many families headed by women are also poor. These are either widows or women whose husbands are away working and do not make enough money to send much home.

Crop marketing. Crop and livestock markets in the five governorates are completely informal and fragmented, with no management or organizational structure.

There are no post-harvest handling systems to handle fruit and vegetables, resulting in up to 50% loss of these products, which are produced with scarce and valuable groundwater. Products such as oranges, apples, and even tomatoes often arrive at local and regional *souks* piled in the back of a pickup truck.

Some fruits and vegetables are traded locally, and some are exported, either to other parts of Yemen or through northern borders to Saudi Arabia. Trade with the Saudis is impeded mainly by concerns over food safety and a lack of standardization and adequate packing. Only a small fraction of the potential for exporting to the lucrative Saudi market is being realized.

The GOY has recently constructed wholesale markets for fruits and vegetables in Sa'ada and Marib, and one is under construction in Shabwa. All three of the facilities are equipped with

modern cold storage facilities that are also capable of storing fruits and vegetables as well as chilled meats. These markets are all well designed, although they will require some additional improvements to operate effectively.

The Sa'ada market has only recently begun to operate. The cold rooms are being used on a limited basis. This market also has a locally constructed packing line for fresh fruits and vegetables that will require additional modification to operate properly. The local manager is inexperienced and will need considerable support to capitalize on these investments.

The market in Marib is not yet operating, due to local political issues and because of a problem with the generator for the cold storage. The national ACU informed the Assessment Team that a cooperative from Dhamar has been assigned to operate the Marib market, and that the generator will soon be repaired and placed in operation.

These new wholesale markets with cold storage facilities offer a significant potential to reduce marketing bottlenecks for fruits and vegetables, to expand formal trade with Saudi Arabia, and to boost employment and the economies in the five governorates.

The potential of these markets will be realized only if they are managed properly and if the cooperatives that operate them ensure that they are open to all private marketers. Several agribusiness companies in the fruit and vegetable sector expressed an interest in using these facilities.

Recommendations

Provide technical assistance and management support for two of the new wholesale markets with cold storage facilities that were built to receive and process fruit and vegetables. Essential elements of this program would include:

- Making minor but essential improvements to these facilities. This will include minor repair work such as repair of the generator for the cold storage in the Marib market. Both markets will require asphalt paving of the outdoor area inside the perimeter fences and around the fruit and vegetable marketing stalls.
- Providing management and technical assistance to establish procedures for post-harvest handling and to collect and package fruits and vegetables from local farmers.
- Carrying out this work in conjunction with the cooperatives that have been assigned by the MAI to manage these markets, but ensuring access by private agribusinesses that wish to use the facilities, based on reasonable user fees.
- Providing managerial and technical assistance to establish procedures for post-harvest collecting, handling, and packaging of fruits and vegetables from local farmers.
- Setting up small quality control laboratories in existing buildings of both facilities, and providing simple cleaning and packing lines that will pack fruits and vegetables to meet international standards.
- To support these activities, gather information from established export market facilities at Hodeida, to determine their quality control standards, packaging specifications, and availability of market information.
- On the basis of what is learned in the preceding step, consider promoting the organization of an association of growers and traders at the national level, which would work toward the establishment of workable national standards and update any existing laws or regulations.

Livestock marketing. Livestock markets are completely fragmented, with no formal structure and no market information. Animals are often sold in local *souks* in the midst of fruit and vegetable sellers. The *souk* setting, while colorful and interesting, is both disorganized and unsanitary.

Despite the importance of livestock to area farmers and herders, there has been a severe neglect of market development. The lack of a formal marketing center such as a sales barn or sales yard with holding stalls, leaves the livestock producers at the mercy of scalpers who dominate the informal markets.

Improved livestock marketing is required as an incentive to improve and expand livestock production. It will enhance the benefits of feeding concentrates to small and large ruminants. Improved markets will provide an important additional source of income to livestock producers, and they will stimulate the economies in the governorates where they are located.

Recommendations

- Provide support to develop Livestock Sale Barns (LSBs), to be established in two or three of the governorates, aimed at establishing a formal marketing structure.
- The LSBs need be only simple fenced-in areas with roofed holding pens for segregation, located near but not directly adjacent to the fruit and vegetable processing and marketing centers. They would include several water tanks and feed bunks, dispersed throughout the enclosed area. This will allow traders and producers to hold animals overnight for sale the following day.
- The LSBs would be planned and approved of by a group of interested traders, farmers, cooperatives, local officials, and sheikhs in the area. In addition to marketing services, they should provide updated market information, extension assistance, and veterinary assistance.
- The LSBs should be under the supervision of the Animal Production Department in the local agriculture or RADA office, or perhaps the local council, with a board of directors made up of traders, farmers, and cooperative members.
- The LSBs will require a small office for the manager and may include several livestock handlers. A fee would be assessed based on number of livestock brought in or held overnight by each user.

Livestock Feeds and Forage. Livestock feeds and forage are in very short supply in all five of the governorates. The livestock sector has been seriously neglected by research and extension for many years. There have been some experiments with improved feeds for sheep, but with limited on-farm follow up and no attention to economic viability.

The commercial poultry and dairy sectors have demonstrated that they can operate effectively and economically on imported feedstuffs. Importation of feed grains and supplements could potentially reduce the serious feed and forage bottleneck suffered by both small and large ruminants, fill gaps in the feed calendar, and take pressure off the rangeland.

Several commercial poultry producers have feed mills that operate in parts of the five governorates. These producers have experience in formulating balanced feed rations, and their mills have capacity to produce balanced feeds for small and large ruminants. They expressed strong interest to the Assessment Team in doing so.

Livestock farmers, particularly women, are not educated as to the value of properly feeding a nutritionally balanced ration. They are not aware of the benefits of such rations, such as faster gain, reduction in disease, better animal quality, more food for the family, and increased income.

If the feed–forage bottleneck can be overcome, these producers would be able to feed their families better, and there would be an expanded marketable surplus of larger, higher quality animals.

Recommendations

Consider supporting an applied research project for a demonstration farm that would evaluate the feasibility and value to the small farmer of an economically balanced feeding program. The following points are integral to this program:

- The demonstration farm would be in one or two selected governorates. It would have several pens of sheep and goats, and perhaps cows, with one pen being fed a balanced feed ration, and the other with local feeding practices.
- A logical place for one of the research demonstrations would be Marib, since the ERADA staff there have already established a small sheep-feeding demonstration project.
- Selected specialists from the university, or MAI economists and livestock nutritionists, should be engaged in the design and layout of these activities, to evaluate alternative rations, assess overall costs and returns, and help identify alternative feeding and management practices.
- The demonstration should provide a practical, hands-on example of proper animal husbandry for the farmers. There should be a series of feed trial workshops for farmers brought in from the surrounding governorates.
- The feed for the demonstration farm should be provided through a private sector feed mill. A cost-sharing program could also be considered that would be appropriate for this project and the private sector.

Role of the MAI at the Local Level. The presence of MAI activities differs in these governorates. Four of the five governorates are served by RADAs, which are semi-autonomous but fall under the supervision of the MAI.

Sa’ada and Amran come under the NRADA, which has its headquarters in Sana’a and offices in the two governorate capitals. The ERADA has its headquarters in Marib and an office in Al-Jawf. Shabwa has an *Office of Agriculture* located in Attaq, the governorate capital.

All of the governorate-level agricultural entities have extension services, and they carry out other activities such as design and construction of irrigation structures, control of soil erosion, and provision of veterinary service.

Agricultural Extension. MAI-supported extension services are present in each of the governorates, but they lack logistic support and have very limited operating budgets. They have few vehicles, and there is a shortage of funds to buy fuel for the vehicles they do have.

In addition to offices in the governorate capitals, there are small extension centers in most districts, although they have very limited equipment. Few have vehicles, which makes it very difficult to visit farmers. Some of these centers are not operating at all.

The budget limitations faced by extension are at least partly explained by the fact that there is no separate program budget for extension.

Extension agents have had very little training during the past 6–10 years. Thus, many are poorly prepared to inform farmers on good practices or to help them address production problems that may arise.

Extension agents lack current technical brochures to provide to farmers. There is little, if any, audio-visual equipment, which would often be preferable to providing written material, given the relatively high rate of illiteracy among farm women and older farmers.

There is no effective program guidance for extension at the local level. Although national policy emphasizes the need to focus on rain-fed crops and livestock, this is not reflected in the orientation of local programs.

Reflecting the past policies of government and donors, extension agents and local agricultural officials still work mainly with irrigation farmers. They do not know many rain-fed crop farmers or range livestock producers, nor are they well prepared to meet the needs of these groups.

The lack of training and the absence of program guidance at the local level reflect the failure of the extension system at the national level, and specifically that there is no entity within the MAI that is responsible for extension training or for overall coordination and supervision of extension.

The preceding limitations notwithstanding, the fact that extension centers are in place, and most of them with assigned staff, provides an opportunity to reach local farms, provided that extension receives relevant training and improved logistic support, particularly transportation.

Recommendations

- Improve extension support at the local level, specifically for rain-fed crop and livestock production, and also to support improved crop and livestock marketing.
- Provide specific operating budgets for extension activities.
- Improve transportation and other logistics support, in order to re-activate extension centers in districts that rely primarily on rain-fed crops, and in districts with heavy concentrations of poor livestock producers and herders.
- Provide training for selected extension staff to support crop and livestock production in targeted districts. This training should be organized to incorporate the latest information on rain-fed crop and livestock production available through the AREA and its regional stations.
- Training may be planned and organized with the assistance of the National Agricultural Training Center at Dhamar.
- If the Extension Service is reorganized at the national level, it may be more appropriate for the training to be planned and organized through the new extension authority or department in the MAI, or whichever agency is given overall responsibility for extension.
- Consider enlisting ICARDA or ICRISAT to develop a training strategy and action plan. Consider, too, engaging the support of the Faculty of Agriculture at Sana'a University, or one of the other agricultural faculties.

- Training should also be designed to include the private sector, not only as trainees, where appropriate, but also to use specialists from the private sector as trainers, where their expertise merits. Consider contracting some specialized extension functions to the private sector.

3.10 VETERINARY SERVICES AND MEDICINES

Veterinary services and medicines are vital to livestock producers in the rain-fed areas. All five governorates have serious problems in control of diseases, which are widespread within the livestock population.

In most governorates, veterinary services are headed by veterinary doctors. The number of veterinary technicians varies widely from one governorate to the next. Coverage of veterinary service centers and technicians at the district level are limited. Many veterinary service centers no longer function, and services provided by others are limited on account of insufficient budgets and logistic support.

The veterinary service facilities have a potential for addressing the widespread livestock disease problems, but this potential is not being realized because the centers are largely inoperative.

The veterinary services suffer from the same limitations in training, operating budget, equipment, transportation, and other logistic support noted for extension.

Most available veterinary medicines are distributed by the private sector dealers who have agents in the capitals and some of the main towns. The veterinary medicine dealers often provide advice to producers who buy medicines from them, but they often lack sufficient training to be very effective at this.

It is especially difficult for the many herders who operate in remote villages and range areas to reach government veterinarians or technicians with their sick animals, or to go to input shops for medicines and advice. The lack of vehicles is a serious constraint to veterinarians and input suppliers alike.

Recommendations

- Provide the financial and technical support necessary to reactivate the existing veterinary service centers in the districts of the five governorates.
- Provide mobile veterinary units to each of the five governorates. Equip these with field laboratories that can provide the necessary treatment and diagnostic tools for field service application.
- Mobile units will work in conjunction with the reactivated district veterinary centers to reach rural areas in districts that do not have centers. These units will be scheduled to arrive at designated villages during the local “*souk* day.”
- The units will also be equipped with an audio-visual aid system to broadcast educational information relevant to local agriculture, and to broadcast the latest information on agricultural prices at nearby markets.
- The mobile units will be staffed with one professionally trained government veterinarian and a technical assistant.

- MAI's contribution: to provide funds to stock the mobile unit with the necessary veterinary medicine to treat small and large ruminants. To prevent disruption and promote further development of existing markets, veterinary medical supplies will be purchased from the private sector in the governorates, and dispersed to the farmer at cost price, without markup.

Natural Resource Constraints. Yemen has limited land, water, and other natural resources. Agricultural land in many governorates is severely at risk to sand encroachment and desertification, and fertile soils are eroded along wadi banks during high spate flood events. In addition, fertile lands that do not receive regular spate water are at times abandoned. Agricultural terraces are constantly degraded from soil erosion. Groundwater is witnessing severe overdrafting and depletion in many aquifers; spate water is reasonably used, but more could be done to improve the spate irrigation efficiency. The MAI has made successful interventions aimed to achieve improved management of the Yemen natural resources, but more work waits to be done in the five target governorates.

Recommendations

- USAID work with the MAI to improve the management of natural resources that are experiencing severe limitation (water) or subject to serious deterioration in the five governorates.
- Consider support for project to limit soil erosion, prevent sand encroachment, reverse terrace degradation, develop new spate irrigation or other water harvesting approaches, improve efficiency of spate or well irrigation, or establish improved management on degraded range grazing areas.
- Work with the MAI to improve its system for evaluation of natural resource projects, to include benefit-cost or other evaluation procedures that are useful in identifying the best project. Also work with the MAI to ensure that its evaluation and selection process is transparent.

4. GENDER ROLES AND NEEDS

In development activities, a gender perspective refers to focusing on how men and women affect and are affected differently by society, the economy, and related policies and programs. Gender is extremely important in Yemen. Because men and women have such different gender roles, they have very different needs and priorities. Although rural women have heavy economic and social responsibilities, their ability to fulfill these responsibilities is limited when their specific needs are not addressed. In the past, failure of development programs to address women's needs in meeting their considerable agricultural responsibilities has contributed to the underachievement of these programs.

Tribal traditions and cultural inequalities in the status of men and women are woven into the texture of Yemeni urban and rural life. Women are considered weak and therefore are to be protected. They are sheltered from contact with males outside their own immediate families. This sexual segregation often works to women's disadvantage (e.g., restricted access to education). Their participation in community life and decision-making is limited. The heavy male dominance of the health professions makes it more difficult for women to obtain medical care than for men.

Economic decisions and relations external to the household are largely the responsibility of men, and women have primary responsibility for domestic affairs, raising of livestock, and production of basic food crops. Women's value is measured mainly in terms of their agricultural and domestic contributions, with emphasis on their fertility, particularly in producing male offspring.¹⁹

Gender roles vary regionally within Yemen. Roles differ in coastal and mountain cultures, as well as urban and rural. Cultures in the northern highlands and eastern high plains regions of the five governorates targeted by USAID (see section 3) are noticeably conservative compared with coastal and major urban areas. Nevertheless, women's roles are changing rapidly even in the five governorates. Female educational enrollment and literacy, while still low, are increasing. Women's participation in the 2001 elections is reported to have been dramatically higher than in elections of the early 1990s.

A factor that has shifted rural women's gender roles during the past three decades is the migration of men for work. They have migrated either to other nearby countries, as was common before the 1991 Gulf War, or to urban areas within Yemen, as has been more common since then. When men migrate, women often become the de facto head of household. They take on new responsibilities and have corresponding needs for support, in order to sustain the family's economic livelihood and farming operations.²⁰

The importance of women's role in Yemen's rural economy has slowly gained recognition over the past three decades. It has been reflected in agricultural policies and programs. Activities related to women were incorporated in agricultural and rural development projects implemented during the 1970s and 1980s. The RWDD was established in the MAI in 1986, with a staff of

¹⁹For more details, see Colburn, Marta, *Gender and Development in Yemen*, Oxfam and Friedrich Ebert Foundation, 2001.

²⁰For details on female-headed households in Yemen and other Middle Eastern countries, see El Solh, Camillia, *Female-Headed Households in Selected Conflict-Stricken ESCWA Areas: an Exploratory Survey for Formulating Poverty Alleviation Policies*, UN, Economic and Social Commission for Western Asia, New York, 2001.

three females. The RWDD was upgraded to the RWDGD in 1999, reflecting policy priorities that were identified in the Aden Agenda process (see section 2).

4.1 GENDER ROLES IN AGRICULTURE AND LIVESTOCK PRODUCTION

4.1.1 Women

The key role of women in rain-fed agriculture is widely recognized.²¹ MAI studies have shown that women provide about 75% of the total labor required for agricultural activities in general. They perform an estimated 80% of the livestock work.

Women are largely responsible for the production of food crops, mainly sorghum grown on rain-fed land for family consumption. The crop production activities performed by women in the rain-fed crops include sowing seeds, weeding, guarding crops in daytime, and harvesting and threshing sorghum. What is less often understood is that women also carry out important steps in the production of the irrigated cash crops, such as planting and weeding, and they become almost solely responsible for these when men are away working.²²

Women have even more responsibilities in livestock production than in crops. They are almost solely responsible for the production of the smaller livestock (i.e., sheep, goats, and poultry) as well as for milk cows. Furthermore, they are likely to be responsible for gathering forage for the larger animals, camels and cattle. In general, they do shed cleaning, milking, milk processing, animal feeding, and animal husbandry. Although customarily restricted in venturing outside the family compound, women nevertheless do most of the herding of grazing animals.

The livelihood of rural families with no tillable land depends exclusively on raising livestock. Thus, women are likely to have particularly large burdens in landless families.

Women tend to be responsible for the time-consuming and labor intensive tasks, and perform most of these manually, with simple, unimproved tools. Women also do seasonal labor on large irrigated farms at a wage one half or less of male laborers doing similar tasks.

Yemeni women perform their agricultural duties in addition to carrying out important household and reproductive responsibilities. These normally include giving birth, child care, food preparation, family health care, household maintenance, and water and fuel gathering. Obtaining water can be especially burdensome and time-consuming in rain-fed rural areas. Household labor-saving devices and realignment of gender roles to help eliminate bottlenecks in women's busy time schedule, and to reduce excessive physical burdens, may in some instances be even more important than supporting them with improved farming methods.

4.1.2 Men

The men's role in rural areas is also well defined. Men are normally responsible for the heaviest burdens in farming, especially plowing and the more arduous harvesting and threshing activities.

²¹While intended to apply generally to women's agricultural role in Yemen, the description provided here is based particularly on the Assessment Team's observations and gathering of information in the five governorates: Sa'ada, Amran, Al-Jawf, Marib, and Shabwa.

²²The extent to which they assume full responsibility depends on whether there is an older son, or father- or brother-in-law to assume the tasks of the migrant male head of household.

They are responsible for managing the camels and cattle, including the herding of these animals. Since cultural norms restrict women's dealings with men outside the family, the male head of household is responsible for most of the product marketing. For the same reason, men normally deal with input suppliers. Consequently, and because they are more likely to be able to read, men tend to be the ones to apply farm chemicals and pesticides.

When men migrate, they are expected to send money back to their wives to support the family. This is normally done, but in varying degrees, depending on the income that they earn. Reportedly, Yemeni men who migrate for work often do not earn high incomes due to their limited education and experience; thus the amount that they can send their wives is limited. Remittances are sometimes infrequent due to difficulties in sending money safely, which can leave women in a bind to support their families. In cases where the worker's income allows him to send significant payments, and where these are sent regularly, families of women with migrant husbands often do better economically than other families.

Whenever possible, migrant men return home to help their families at critical times in the agricultural calendar, such as field preparation and harvest times.

4.2 GENDER CONSTRAINTS AND THEIR IMPLICATIONS FOR WOMEN'S DEVELOPMENT

4.2.1 Literacy and education

As noted previously, women are at a disadvantage to men in education. This is especially true in the five USAID governorates, where gender gaps in education are more pronounced than in other rural areas:

- The literacy rate for women is only 15%, compared with 65% for men.
- Moreover, women are still far behind men in school enrollment; in primary schools, female enrollment rates are only 38% of men's rate.
- At the secondary level their rate drops to just 14% of men's rate.

These limitations in literacy and education are a key factor in many of the constraints that women face. They place women at a disadvantage in:

- Understanding technical aspects of farming and obtaining related information.
- Learning better techniques for carrying out household duties.
- Managing money, obtaining credit, and understanding how to market their products.
- Forming groups, such as cooperatives, to obtain credit or carry out marketing.

4.2.2 Obstacles in marketing and obtaining inputs

Marketing is men's responsibility in rural Yemen. Virtually all traders and input suppliers are men. With the prevailing sexual segregation, women are simply unable to deal directly with these men. This is accepted by women since it reflects deep social values; it is not likely to change very quickly.

Because they themselves cannot deal directly with traders and merchants, women require an intermediary to deal for them. Often the intermediary is the husband,²³ although it can be another family male or a group, such as a cooperative.

4.2.3 Technical constraints that fall more directly on women

In section 3, a number of technical constraints were identified that affect agriculture in rural Yemen, including the five governorates. Because of women's major responsibilities for raising livestock and production of rain-fed food grains, some of these constraints affect them more than men. Constraints that affect women more than men are:

- Scarcity of feeds and forage.
- Lack of veterinary services and medicines, particularly in the more remote areas. Women's inability to deal directly with male veterinary technicians and medicine dealers adds to the problem. Owing to illiteracy, most women have difficulty in accessing information on drugs and diseases.
- Inadequate livestock housing, watering tanks, and feeding troughs.
- Not many higher-yielding crop varieties for the rain-fed grains, and those that may exist are not being effectively multiplied or distributed.
- Women are particularly vulnerable to the scarcity of credit because they cannot deal directly with male credit officers, and because they usually have no land in their own name to offer as collateral. The CACB has no female loan officers.

See section 3 for details on these constraints, and on how to deal with them.

4.2.4 Missing: Technologies that meet women's specific needs

Agricultural tools, such as scythes and hoes, and most technologies have been designed for and by men, to match men's physical characteristics. Rural women have little opportunity to influence the design of these tools, since they either are imported or are fabricated in local shops run by men. Their ability to purchase and select these tools directly is limited, as with their access to other agricultural inputs. This situation reduces the productivity of rural women's labor.

There is a paucity of common household labor-saving devices to free up time in women's busy schedules. Such devices might include sewing machines, improved cooking utensils, and simple water-harvesting devices.

4.2.5 Participation in groups and community decision-making

Owing to sexual segregation, it has been the man's role to handle external affairs for the household. Consequently, the role of rural women in community decision-making processes is limited. This means that they have little voice in decisions related to issues that affect their daily social and economic activities. For example, they have little opportunity to influence decisions on schools or community water projects.

This situation is gradually changing. As a result of women's increased political participation, a few female members have been elected to local councils that have been established under the

²³The Assessment Team interviewed one woman who explained that her husband keeps about half of the money he obtains from sale of the animals that she raises. She participates in the household decision process as to how the rest of the funds from the sale are to be spent for the family's basic needs. She said she is satisfied with this arrangement.

new 2000 law on local governments. This provides an example that women can engage in community and political affairs.

The need for women's groups and women's participation in other groups is slowly being recognized. Some communities in the five governorates have formed women's associations, sometimes called women's NGOs. Such groups have the potential to become a vehicle for women to market their products and obtain credit.

Table 4.1 lists the organizations groups working in support of women in the five governorates.

Table 4.1 Extension and Groups That Support Women in the Five Governorates

Governorate	Number of Staff in Extension Field Offices		No. of Women's Extension Centers	No. of Women's Cooperative Associations	No. of Women's NGOs
	Staff Education Level				
	B.Sc.	Secondary or Primary			
Sa'ada	-	—	—	—	3
Amran	1	3	1	1	1
Al-Jawf	1	4**			1
Marib	2	8*	3	—	—
Shabwa	5		2		7

*Five of eight are on temporary contracts. **All four are on temporary contracts.

Under the ACU's rules for member cooperatives, it is possible for women to be members in the same cooperatives as men; in fact, there are women members in some cases. The Assessment Team was not able to determine the total number of cooperatives that have women members in the five governorates, or the exact arrangements for women's participation in such cooperatives.

It is also possible to organize separate women's cooperatives under the ACU. One such cooperative has recently been formed for livestock production in Amran.

Prevailing social attitudes and male dominance in community affairs and public administration limit women's participation in organizations and decision-making. Male leaders and officials are often simply not aware of the ways in which the needs of women differ from men's, that there are inequities in treatment of women, and that change is both needed and possible. They do not understand how prevailing attitudes lead to sex-based discrimination.

One approach that has been used successfully to deal with this problem by donor organizations such as the World Food Programme (WFP) is to include gender sensitivity training in their development programs and projects. This training educates men and women on the ways that certain attitudes and social practices work to women's detriment, and on how the community and families can benefit from the broader participation of women in education and community affairs.

Another successful practice of the WFP is to require either (1) that women be members of project decision-making bodies and that some women hold leadership positions in these bodies, or (2) that special women's groups be formed to express their needs and priorities to the overall project management group.

In recent years the GOY, with the support of some donors, has sponsored the implementation of micro-credit programs targeting women. One agency that has established such programs is the SFD (see section 3). A problem that these groups have faced is that they must be offered through groups that are formally registered as women's associations (NGOs), with the Ministry of Social Affairs. The registration procedure is complex and time consuming.²⁴ It poses a particular challenge for women who are illiterate. This helps to explain why far more women's NGOs and micro-credit groups are to be found in urban areas than in rural areas.

There are only 12 NGOs in the target governorates, the majority of which are located in Shabwa (Table 4.1). To the best of the Assessment Team's knowledge, none of these groups operates a micro-credit activity. Nevertheless, the fact that 12 NGOs exist does provide a starting place to work with women in these areas.

4.3 PROGRAM OPPORTUNITIES

4.3.1 The MAI, agricultural extension, and the RWDGD

In section 3 it was noted that the agricultural extension system has been quite weak, it lacks operating budget and logistic support, and there is no effective program guidance at the national level. Moreover, extension has not focused on the problems of rain-fed crops or livestock production. Most extension agents are men, whereas most of the farming is done by women.

The development of the Women's Directorate (RWDGD) in MAI provides an opportunity to address the needs of women, and thus to support improved crop and livestock production. Unlike other units within the MAI, the RWDGD has worked to develop a specific cadre of extension agents in field units that are actively monitored by this national directorate in the MAI. The RWDGD operates under a recent policy statement that recognizes the importance of livestock as an integral part of a rural farming system that includes rain-fed production of basic food grains for family consumption.²⁵

The overall objective of the RWDGD is to promote gender-sensitive agricultural policies, programs, strategies, and projects that focus on the economic role of rural women. The Directorate has received significant assistance from the Netherlands' government, through capital investment and technical assistance. Much of the assistance was spent on human resource development (training), institution building, and improving operational facilities in the field offices. The training was oriented mainly toward developing skills in organization, planning, and gender analysis. Apparently, little attention was paid to developing skills in technical agriculture.

Among the five governorates, the RWDGD currently has trained staff in all its field offices except Sa'ada, where no office or program has been established (Table 4.1). There are a total of 24 women agents in the four governorates with offices, with Marib having the greatest number (eight). The qualifications of these staff members vary. Nine have B.Sc. degrees, 9 of the 15 agents have only secondary or primary certificates, and 9 are on temporary-hire status.

²⁴The Assessment Team was told that registration requires a trip to the Ministry's national headquarters in Sana'a.

²⁵GOY, MAI, RWDGD, "Gender Policy on Agriculture and Food Security," supported by the Royal Netherlands Embassy, June 1999.

Women's extension field offices in Marib and Shabwa have been relatively well equipped. Means of transportation are lacking in all the four governorate offices with programs, except in Shabwa. Although the Assessment Team witnessed the frustration of women extension agents working without adequate logistical support and funding, a number of cases were observed in which these agents had managed to overcome these limitations and do admirable work. In general, the women agents' motivation is quite high.

The fact that these agents are women enables them to communicate with women farmers, which is normally impossible for male agents. However, many of the women agents lack technical training in agriculture. All of the subject matter specialists in crop and livestock production are males. Therefore, it is essential that the female agents be able to work with male agents, to receive their support. Although working relationships between male and female agents do exist in most of these governorate offices, many of these relationships are still not strong.

There are six special women's extension centers located in three of the five governorates (Table 4.1). The Assessment Team visited the center in Amran. The building was well constructed, but its furnishings and equipment were limited and only marginally functional. There were sewing machines and a kitchen for food preparation, but there were no displays or information related to crop and livestock production. There was no audio-visual equipment. The agent in charge was working with a group of town women from Amran who lived nearby, but there was no transportation to reach out to women located at greater distance.

4.3.2 Technologies that address the needs of women

With donor assistance, the RWDGD has identified a number of technologies that would be particularly useful to rural women (See Annex 10, Table 2). These include:

- Rainwater-harvesting systems for roofs.
- Simple, improved hand tools, including implements to facilitate the chopping of fodder.
- Poultry keeping, improved flocks, and housing.
- Feeding troughs for animals and use of bone ash to improve animal nutrition.
- Roofing for animal sheds, ventilation of stables, and digging water tanks for animals.
- Electric butter churner where electricity is available, or improved hand churners.

In one governorate, the study team also witnessed a project, sponsored by the TELEFOOD project through the FAO, that provides sheep to poor women as a loan, with the requirement that they repay the loan with half of the live offspring produced in the first two years. The women involved were very enthusiastic about this project. The Assessment Team's observation is that, while this is a suitable project, it will succeed on a larger scale only if combined with better technical support.

4.4 SYNTHESIS OF FINDINGS AND RECOMMENDATIONS

It is estimated that rural women provide about 75% of the labor requirement for crop and livestock production activities, in addition to their heavy family responsibilities in raising children, preparing food, and maintaining the household.

They are limited in carrying out these responsibilities on account of ingrained social attitudes and sexual segregation. Yemeni women have specific needs that are related to their gender roles. In

the past, failure to recognize these needs has often resulted in the underachievement of development programs.

The work that rural women perform is usually carried out manually or with unimproved hand tools. They have not had support in obtaining improved technologies and labor-saving devices that would free up their very limited time. This has adverse effects on farm production and incomes in rural communities.

Rural women have little access to markets for agriculture and livestock products and inputs, since it is difficult for them to have business dealings with men other than their own family members. This has also limited their access to credit.

The MAI has taken steps to address the needs of rural women. The RWDGD has been developed in the Ministry, and female extension agents have been hired and posted in the rural authorities and agricultural offices in most of the governorates. Training has been provided for female extension agents in organization skills and gender analysis. They need more training in technical agricultural matters.

Field offices have been established for women agents in four governorates and women's extension centers have been constructed in a few districts. These facilities lack transportation, logistic support, and audio-visual equipment.

The RWDGD has documented a number of technologies that would be particularly useful to rural women. These include rainwater-harvesting systems for roofs; simple, improved hand tools; feeding troughs; improved poultry flocks and improved shelters for animals; and improved milk churns. These technologies are described in a proposal that was prepared by the RWDGD (see Annex 10).

A project that provides sheep to poor women as a loan also shows great promise. The Assessment Team thinks that this project could succeed and be expanded if it were combined with better technical support.

The RWDGD and the women's extension offices in the five governorates provide a significant opportunity to achieve relatively quick impacts by addressing women's needs.

Recommendations

- Support and strengthen the RWDGD women's field units in the five governorates in terms of transportation, audio-visual equipment, and selected additional training.
- Support the women's extension program in establishing and strengthening women's groups (cooperatives, micro-credit groups, and other NGOs) to help women overcome their limitations in marketing, input procurement, and credit.
- Provide selected technical training to female extension agents and promote a stronger working relationship between female extension agents and male subject-matter specialists, in order to strengthen the female agents' capacity to support the crop and livestock production needs of farm women.

- Extension programs and other community training should include training and information on gender issues. This is designed to help farmers and community leaders develop an appreciation of the special needs of women, particularly the need for women to participate in community organizations and decision-making.
- Support the RWDGD and its field units in making the technologies listed above available to women in these governorates.
- In addition to water harvesting, the program should consider development of cisterns and other water system improvements that would be of particular use to women. In this regard, it would be useful to consider similar programs to those of the SFD.
- Given the high importance of sheep to rural women in the five governorates, it is particularly recommended that the program include a sheep component to provide in-kind loans of animals to poor women farmers. The program should provide adequate technical guidance to participating women.
- To provide the required technical support for sheep raising and other women's technologies, consider engaging ICARDA, Heifer International, or another NGO to help the RWDGD implement the program on sheep raising and special technologies for women. The supporting organization should have qualifications and experience in managing development livestock projects in settings similar to rural Yemen.
- Consider providing support to the RWDGD for developing a nationwide radio program that would address women's concerns in general, and agricultural and livestock issues in particular.

5. INTERNATIONAL FINANCIAL INSTITUTIONS AND OTHER DONOR PROGRAMS

This section focuses on donor activities in agriculture and in trade-related areas of immediate or midterm interest to the agriculture sector. It should be read as a partial update to the recent, excellent coverage given in Annex 8 of USAID's *Interim Strategy for Assistance to the Republic of Yemen* (April 2003).

Most of the information in the section was provided to the Assessment Team in direct, personal interviews with donor representatives. To preclude misapprehension of the scope of the section, we offer the following:

- Time allocated to information gathering from the donor community was limited and did not permit exhaustive coverage. The Team did not visit the Arab donors or the UNDP office, and since other respondents indicated that little if anything had changed in their portfolios since USAID completed its research in 2003, the brief commentary on their activities comes from third-party documentary sources.
- The section does not include donors, such as Italy, whose activities in agriculture are entirely limited to a few micro-projects and who are not supporting trade initiatives.
- Because the Team's interviews were personal and off the record, the discussions include considerable subjective information where this is deemed relevant to USAID's objectives for the present report.
- Nearly all the information is original from the source and gathered in large part from personal interviews rather than from written documents. The nature of the information gathering allows for some of the valuable subjective points of view conveyed, but also may have resulted in lacunae or minor inaccuracies.
- To provide continuity, however, in some instances the discussions incorporate data from Annex 8 without further reference.

The Team believes it useful and pertinent to mention in this report that it was received with warmth by the donor representatives, and that many of them expressed interest in knowing about USAID's programs, while several expressed interest in the possibility of future collaboration.

The European donors appear to be aware of each other's bilateral interventions as well as of the programs of the multilateral agencies, especially those of the World Bank. It goes without saying that they work with and partially through the European Commission and are fully aware of EU assistance.

5.1 THE WORLD BANK

As of December 2003, the Bank had an active portfolio worth \$809 million in approved credit, of which approximately \$305 million had been disbursed. Only 10% of the credit value and 3 of 23 projects were attributed to agriculture. The Bank's project classification taxonomy is not identical to USAID's. One project (Seeds and Ag. Services) that is classified in the Social Protection category by the Bank would clearly be regarded as part of the agriculture portfolio by USAID and will be included in the following discussion.

“Seed and Agricultural Services” has a credit of \$12.5 million and was designed to improve productivity on both rain-fed and irrigated plots in 14% of Yemen’s cultivated land. The project is slated for closure in June 2004 and is regarded by the Bank as a success.

The “Southern Governorates Agriculture Privatization” project had a credit of \$24.7 million and was designed to raise the incomes of 50,000 people in very poor families in the zone. The project will close in June 2004.

“Irrigation Improvement” is a \$21.3 million project intended to ensure sustainable water conveyance in two spate irrigation schemes in Tuban and Zabid. It will also work in participatory irrigation management. The project is scheduled to terminate in 2006.

There are several new developments of potential interest. Only recently the Bank negotiated a credit of \$40 million for a soil conservation and drip irrigation activity to be housed in the MAI. Also, the Bank has recently begun to discuss work in rain-fed agriculture. So far, the discussions are preliminary and have no monetary figures attached. Also in the stage of preliminary discussion is a request from the GOY for support to the fisheries sector, including mariculture.

The Bank has also been active in international trade. On behalf of the Integrated Framework (IF) donors, it managed the comprehensive *Diagnostic Trade Integration Study*. In its *Poverty Reduction Strategy Program*, the Bank is clear about the importance of mainstreaming trade for economic development. While the Bank will participate in IF discussions, it has at present no credits slated for future activities or studies.

5.2 THE FAO

The FAO has two new projects expected to begin in the first quarter of 2004. One is called “Livestock Pilot Development.” No information was made available on this activity.

The second, “Strengthening the Food Inspection System in Yemen—Codex Alimentarius,” will have a funding level of \$169,000 and is expected to begin in the first quarter of 2004. This is an important project for USAID to follow, as it is directly concerned with food safety measures. Its objectives are ambitious in light of its modest budget, but they are very important. They include a reorganization of the national food control system and the establishment of a National Codex Committee with professional training.

New and current activities include the following:

- “Introduction of the FAO-GTZ MicroBanking System in the Cooperative and Agriculture Credit Bank.” This is an active, ongoing project funded at \$383,000. Its objective is to support the restructuring of the CACB through introduction of an MIS that will “ensure efficiency, timeliness and low cost operations.” The project has already prepared the user manual and training materials, and delivered one training course in Sana’a.
- “Assistance to the Union of Fishermen’s Cooperatives.” With project dates extending from October 2003 to March 2005, the project is intended to help organize and expand a national fisheries cooperative structure. It has a budget of \$177,000.

The FAO has other ongoing projects in animal health, water management, food security, crop production and protection, the environment, and fisheries. (There are also five Telefood projects in sheep fattening.)

The following projects are in the terminal phase:

- “Surveillance and Strategy Formulation for Rinderpest and Other Major Diseases.” The last workshop took place in October 2003. It was funded at \$89,000.
- “Water Control Component of the Special Food Program.” Funded at \$346,000, the project focused on irrigated agriculture in seven pilot sites. The project’s terminal statement will be submitted in the first quarter of 2004.
- “Improvement of Date Palm Production.” As a contribution to food security, the project experimented with varietal improvement and modern irrigation. Funded at \$288,000 and considered satisfactory in achievements, the project’s terminal statement will be submitted in the first quarter of 2004.
- “Support for the Establishment of a National Food Insecurity and Vulnerability Information and Mapping System.” The project suffered delays and failed to reach all of its objectives. Data processing has been completed for 85% of a survey of 110,000 households. Funded at \$249,000, the project reached mandatory closure in December 2003. Other donor contributions will allow for completion of the data entry and analysis.
- “Management, Use and Control of Prosopis.” The project focused on the production of *prosopis juniflora* as an enhancement of food security. It had a budget of \$189,000, and its terminal statement will be submitted in the first quarter of 2004.
- The FAO is seeking other-donor financing for five projects targeting the production and marketing of date palms, olives, mangos, honey, and coffee.

5.3 THE UNDP

Donor representatives did not indicate any major role of the UNDP in agriculture. The agency has a pipeline project called “Community Based Regional Development–Second Phase” waiting approval. Its projected funding level is \$1.8 million. Normally, the UNDP is active in IF activities, as it is one of six organizations that compose IF assistance.²⁶

5.4 THE EUROPEAN COMMISSION

The EC supports private investment, WTO accession, and, indirectly, food security. It has a project with the MAI with one full-time expatriate assistant developing an MIS. Although the end-of-project date is June 2004, the EC expects to extend it for another two years. A midterm review team will arrive in February. The review will include aspects of evaluating the WTO accession process for agriculture.

The EC also financed a census for comprehensive statistics on agriculture. The information will be connected to the FAO’s Food Information and Vulnerability database and should be available to interested parties in March or April 2004 through the Central Statistical Office in Sana’a.

Since 1996 the EC has funded a substantial number of small projects in agriculture through grants and has disbursed €56 million. The funding level has been decreased to about €1 million for 2004 and 2005.

²⁶The others are WTO, UNCTAD, ITC, World Bank, and IMF.

Beginning in April 2003, the EC started working on a project supporting the IF, and the project start date was December 2003. The Commission has just begun mobilizing technical assistance in January 2004. Its five-year program has a funding level of €7 million.

The EC will concentrate its project interventions in Hodeida, Taiz, Dhama, Lahez, and Marib.

5.5 FRANCE

Since 2002 France has classified Yemen as a priority country (*dans le zone prioritaire*). The primary focus is rural development, in which technical assistance in the order of €2.5 million will go primarily to support livestock cultivation (*élevage*). The objective is to augment and stabilize the income of the small-herder. In the first phase of the project—which will be implemented in 2004—the emphasis will be on improving the productivity of the herders, using technical training facilities for practical, on-the-job training. France estimates that 90% of the small herders in its target zones are women, and therefore the bulk of the assistance will be directed to them.

In the second phase of the project, technical assistance will focus on diversifying production and improving quality in order to add value to exports in the regional markets of the Gulf States and in Djibouti. Genetic as well as sanitary and phytosanitary aspects of production will be considered. Improving packaging and quality control at the level of wholesalers will also receive attention and assistance.

In parallel with the livestock improvement, there will be assistance in small-scale fruit and vegetable production using micro-aspersion techniques of irrigation.

The structure of the technical assistance will be through grants to herder groups or associations. One expatriate and a national counterpart will manage the project.

The project will focus on Daides, Wadi Mawr, and the southwest of Taiz.

The respondent expressed interest in collaborating with USAID in fruit and vegetable production and in working on quality improvement with wholesalers.

5.6 GERMANY

Overall German assistance for 2003 was in the order of €38–40 million, with the technical assistance funds channeled through GTZ in the order of €16 million, although only €13 million were disbursed.

Focusing on water and sanitation, basic education, and health and family planning, GTZ is not working directly in agriculture nor is it working in any of USAID's target governorates.

GTZ will support trade through the IF, but will channel its funds (€5 million) through the EC.

5.7 THE NETHERLANDS

Overall Dutch foreign assistance to Yemen has been effectively reduced from €50 to €26 million. Their primary sectors of intervention are education, health, water—especially watershed

management—and, increasingly, decentralization of government. In this last area Dutch assistance will concentrate on long-term capacity building at the governorate and district levels and intends to remain at constant funding levels through 2007. Shabwah will be the focus of an “integration pilot.”

The Dutch work in watershed management, including critical plans for aquifers, will be situated in Taiz.

The Dutch consider their target group to be the poorest among the population in rain-fed areas. This was their target population during their years of collaboration with the MAI, but they emphasize that this is not the target group of the MAI, which prefers to focus on irrigated zones. The government of the Netherlands no longer intends to work in the agriculture sector in Yemen. The representatives explained that years of investment in the sector left very meager results.

In trade, the Dutch are a lead donor in the IF. They subscribe to the World Bank’s assessment in the PRSP of mainstreaming trade as indispensable to economic development in Yemen. So far, however, they have provided only a one-time study tour to a group of Yemeni diplomats that included training in trade negotiations. Over the next three years, Dutch assistance will allocate €800 thousand to the IF in bilateral assistance.

An unofficial opinion expressed by the representatives—with which this Team provisionally agrees—is that Yemen’s membership in the GCC is more urgent and more important in the near-term than its full accession to the WTO.

5.8 ARAB DONORS

Saudi Arabia is a very important donor for Yemen, but its contribution to agriculture is reported to be insignificant.

The Arab Fund is financing some work in irrigation and agriculture, and the UAE are financing some aspects of the Marib dam project.

5.9 OBSERVATION AND RECOMMENDATIONS

During its visits to the agricultural areas of the five USAID target governorates, the Assessment Team observed numerous cases where equipment and facilities provided by donor projects had not been maintained and operated after the project was finished. This was true, for example, of the farming equipment and buildings at the demonstration farm in Amran Governorate, which were said to have been provided by a German project. It was also the case with many of the facilities that had been provided in the Agricultural Development Project funded by IDA in Al-Jawf.

The problem with inoperable equipment and facilities seems to be another facet of GOY and MAI’s budgetary and planning problems in which established facilities and personnel are left without operating budgets.

Recommendations

- The MAI and the MOF must develop the planning and budgetary discipline required to provide sufficient operating funds for all of their activities, and particularly for projects after donor support has ended.
- Donors must insist from the outset of a project that the MAI assume a part of the operating expenses associated with project facilities and activities, then require increasing financial support of operations as projects progress each year, and then carry out the surveillance measures that are necessary to ensure that all essential operating support is continued after donor funding is complete.

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Annexes

**Annex I:
Statement of Work**



Assessment of the Development of Agricultural Initiatives for USAID/Yemen

RFP No. Yemen-279-03-P-047 Task Order Response – Technical Proposal

September 8, 2003

Rural and Agricultural Incomes with a Sustainable Environment
(RAISE)

IQC No. PCE-1-00-99-00001-00

Submitted to:
USAID/Egypt

Submitted by:

ARD-RAISE Consortium
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This proposal or quotation includes data that shall not be disclosed outside the Government and shall not be duplicated, used, or disclosed—in whole or in part—for any purpose other than to evaluate this proposal or quotation. If, however, a contract is awarded to this offeror or quoter as a result of, or in connection with, the submission of data, the Government shall have the right to duplicate, use, or disclose the data to the extent provided in the resulting contract. This restriction does not limit the Government's right to use information contained in these data if it is obtained from another source without restriction. The data subject to this restriction are contained in all sheets and all appendices.

Executive Summary

ARD, Inc. is extremely pleased to respond to the referenced RFP. USAID has asked for an assessment of the agricultural economy of Yemen as a whole, with a particular focus on:

- ◆ Structure and role of the authorities of the Ministry of Agriculture;
- ◆ Comprehensive assessment of the strengths and weaknesses of the agricultural sector in each of six target governorates;
- ◆ Examination of gender roles, constraints, needs, and opportunities in agricultural production;
- ◆ Evaluation of programs of the IFIs and other donor institutions, and of the Yemeni commitment to them; and
- ◆ Recommendations to USAID about possible opportunities for increasing assistance to the agricultural sector.

ARD, Inc. has assembled an excellent assessment team to carry out this assignment. Our nominees for Agricultural Production Specialist/Chief-of-Party and Agricultural Policy Specialist both have had direct experience in Yemen on important assignments in the agricultural sector. All of our candidates have significant experience in the Middle East and North Africa, and are skilled in developing and implementing projects that coordinate with governments at all levels, as well as other key stakeholders at both the national and community levels.

This proposal presents our approach to this assignment. Highlights include:

- ◆ Work plan finalization in the first week, and initial outreach to the five remote governorates that USAID has targeted by Week 2.
- ◆ An **evaluation of the future role of the Ministry of Agriculture**, led by a native Arabic speaker already known and trusted by the Ministry.
- ◆ Workshops of key stakeholders from each of USAID/Yemen's five target governorates to discuss constraints and opportunities to agribusiness development, led by two agricultural production and development experts with more than half a century of development experience between them.
- ◆ An **evaluation of trade barriers and opportunities**, focusing in particular on regional market opportunities.
- ◆ An evaluation of **gender roles and needs** led by an expert with extensive experience in this field in Arab countries.
- ◆ Presentation of preliminary findings and recommendations to USAID in a workshop format amenable to discussion, comments, and suggestions.

Two options are provided for the Mission's consideration regarding team configuration.¹ Option 1 provides a team configuration exactly as called for in the RFP. Option 2, which we strongly recommend, would include a Senior Technical Advisor (STA) from ARD's home office, to augment the team's capacity in policy and institutional analysis and reorientation, as well as to provide extensive experience in the strategic design of USAID agribusiness development programs. The STA also would be responsible for ensuring effective technical direction,

¹ It is our understanding from the Mission's answer to our questions that staffing options that diverge from the one put forward in the RFP are welcome.



responsiveness to USAID priorities and guidance, and quality control of all findings and recommendations.

ARD has had extensive experience conducting strategic assessments in various countries around the world, for the agribusiness sector as well as others, and indeed will be performing an analytical assessment of democracy and governance in Yemen during the period envisioned for implementation of this assignment. As demonstrated by our Past Performance References, ARD is a leader in implementing agricultural and rural development programs in developing countries.

ARD is committed to working very closely with USAID and the Ministry of Agriculture to develop an assessment of agricultural sector constraints and opportunities that provides viable and actionable recommendations. We propose to institute an assessment review process that is fully responsive to USAID priorities, guidance, and concerns.



1. Technical Approach

1.1 Understanding of Constraints and Potential Opportunities

Yemen, despite its proud heritage and tradition, and striking natural beauty, faces a daunting array of impediments to economic growth, and serious prospects of economic decline. The confluence of dire poverty, limited oil reserves, and severely constrained natural resources, especially water, has important implications for social stability and susceptibility to terrorist influence within a region of vital importance to U.S. foreign policy.

According to the most recent government statistics available, 68 percent of Yemeni women are illiterate, as are 28 percent of Yemeni men. The fertility rate is 6.5 children per woman. Infant mortality is in excess of 75 per thousand live births, and malnutrition is observed in 46 percent of children under age 5. Life expectancy for the average Yemeni is only 56 years at birth. More than two-thirds of the population has no access to an improved water source. More than 42 percent lives below the national poverty line.

Economic growth in Yemen was positive and in excess of population growth during the 1990s and early 2000s, in spite of severe drought and civil war, and a dramatic reduction in worker remittances following the 1990 Gulf War. This growth, however, has depended largely on increased oil exports. Currently, oil revenues contribute to more than one-third of GDP. Crude oil accounts for 75 percent of Government revenue and 87 percent of exports. Nonetheless, as projected when oil was first discovered in Yemen, the oil reserves will only last one generation. The World Bank estimates that, at current production levels, recoverable reserves will be exhausted in 18 years.

This means that the nation will have to fall back on other sources of growth, especially agriculture. More than three-quarters of the Yemeni population live in rural areas, and agriculture accounts for more than 60 percent of GDP. Yet traditional rain fed agriculture, much of which requires extremely labor-intensive rock-wall terracing, is in decline. This is true in part because its small scale makes it less amenable to increasing productivity, and also because of other factors, including uncertainty over land tenure. On the other hand, modern agricultural techniques requiring irrigation from groundwater sources have often produced disastrous results. Rates of decline of the groundwater levels are alarmingly high in many zones, especially in the Yemen Highlands, where declines of between 2 and 6 meters per year are commonly observed. In coastal zones, this has led to increased saltwater intrusion.

Despite formidable constraints, there may be significant opportunities for increasing productivity that will allow growth of the agricultural sector while reducing the strain on Yemen's natural resources. These include:

- ◆ Introducing low-water crops and varieties, and hydroponic techniques, and improving yields;
- ◆ Improving water management by strictly regulating pumping from groundwater sources;
- ◆ Developing small dams in ways that encourage local investment and supporting institutions;
- ◆ Reducing post-harvest losses, currently ranging from 30 percent – 56 percent of production;
- ◆ Increasing the efficiency of feedlot livestock production, and the reliability of access to imported feed grains;



-
- ◆ Improving grading and quality control;
 - ◆ Improving storage, packaging, and transport capacity;
 - ◆ Improving transport infrastructure, and increasing competition among transporters; and
 - ◆ Developing wholesale and retail markets, and improving market information systems.

It is clear that it will not be easy, and it will require significant investments of time and money. There is a critical lack of capacity in terms of water management, agricultural extension, farmer organization, infrastructure, and financing, but there are opportunities as well. Situated near the Gulf states, Yemen is next to one of the most lucrative export markets in the Middle East.

Remittances, also mainly from guest workers in the Gulf, have reemerged as an important source of foreign income; according to IMF data, remittances in 2000 constituted some 15.7 percent of Yemeni GDP. Under the right circumstances (e.g., secure land tenure), the families of guest workers abroad may be induced to invest these earnings in the agricultural sector.

Devaluation has reduced the implicit tax on agricultural production and exports that resulted from the strong currency associated with increased oil revenue. Having emerged as one of the most trade-liberalized regimes in the Middle East, Yemen is now poised to take advantage of new opportunities for international cooperation, including international assistance to relieve serious infrastructure and institutional constraints.

In addition, with proper management (including potentially a reorientation of the roles and responsibilities of the Ministry of Agriculture), the resources from one generation of oil revenues could also be utilized to enhance productivity and water usage efficiency in Yemeni agriculture.

1.2 Methodological Approach

USAID has asked for an assessment of the agricultural economy of Yemen as a whole, with a particular focus on:

- (1) reorientation of the structure and role of the Ministry of Agriculture;
- (2) comprehensive assessment of the strengths and weaknesses of the agricultural sector² in each of six target governorates;
- (3) examination of gender roles, constraints, needs, and opportunities in the agricultural sector;
- (4) evaluation of agricultural sector and related programs of the IFIs and other donor institutions, and of the Yemeni commitment to them; and
- (5) recommendations to USAID about possible opportunities for increasing assistance to the agricultural sector, and the specific types of assistance that would be most beneficial.

The RFP for this assessment calls for an eight-week assignment, with a period of six weeks in Yemen, to start on or about September 20.³ It anticipates the need for expatriate consultants with expertise in agricultural policy, production, development and trade, and mandates that at least

² Throughout this proposal, references to the agricultural sector are meant to include both agricultural production and agribusiness.

³ We are cognizant of the fact that Ramadan begins in the week of October 26, and that it is therefore advisable to have the field interviews and workshops completed by that time. Our Implementation Plan takes that time constraint fully into account.



one member of the team be able to read, write, and speak Arabic that can be understood in Yemen. The Assessment Team will work closely with a counterpart representative to be assigned by the Ministry of Agriculture. A local Agricultural Specialist and a local Logistics Specialist will be employed to assist the Assessment Team.

The following outlines our methodological approach to meeting the requirements of the RFP.

The first week in-country, the Assessment Team will be briefed by USAID and other concerned U.S. Embassy representatives (e.g., ECON and USDA), and will finalize a work plan and a schedule of deliverables for the assessment. The work plan will be fully reviewed with USAID, and we will actively solicit Mission ideas and suggestions on the draft outline of the report. The Assessment Team will extend an open invitation to USAID or U.S. Embassy representatives to accompany and participate in all meetings and workshops to be held, as appropriate.

The work will then proceed on two tracks. The first will involve meetings in Sana'a with key policymakers, donor representatives, and leaders from the business, academic, and NGO communities with influence on the agricultural sector, and knowledge about constraints and opportunities for its development. The second will be a comprehensive assessment of the agricultural sector performed at the level of the target governorates, through extensive outreach to and communication with key stakeholders in those governorates. Although there will be significant overlap and cross-fertilization, we anticipate that the first track will pertain mainly to the tasks to be performed by the Agricultural Policy and Trade Specialists, and the second to the tasks to be performed by the Agricultural Production and Business Specialists. These two tracks are reviewed in more detail in the following paragraphs.

(1) Examinations of the Ministry of Agriculture, donor programs and gender issues

As specified in the RFP for the assessment, the Assessment Team will meet with the Minister of Agriculture, and his Deputy Ministers, to discuss agricultural sector policy, structure, constraints, and visions/ideas. The Assessment Team will also meet with key policymakers, private industry leaders, and educational leaders in the capital to gain a better understanding of the constraints and opportunities confronting the sector.

The meetings in Sana'a will be utilized as an opportunity to gather baseline information about trends in agricultural production, business, trade, and natural resource management, in Yemen as a whole as well as in each of the six target governorates. An examination of the structure and role of the Ministry, and changes that will be required to improve its efficiency, will be performed.

Topics to be discussed may include a wide range of issues, some of which will be identified in meetings and workshops to be held with stakeholders at the governorate level (see next section).

Issues likely to be covered include:

- ◆ natural resource management;
- ◆ land tenure;
- ◆ grades and standards and their application;
- ◆ trade regulation and tariffs;
- ◆ technical information diffusion (e.g., extension);



-
- ◆ taxes, licenses, fees, certificates, etc.; and
 - ◆ public sector role and financing (both central and governorate levels) in the sector.

An examination of gender roles and needs in agricultural production, business, and trade will be fully integrated into this series of meetings. Meetings will be sought with representatives of women's groups, organizations of processors, farmers and traders, and other civil society groups with constituencies important for the growth and sustainable development of the agricultural sector.

The Assessment Team will also meet IFI and other donor representatives who have had, or are currently implementing, projects in the agricultural sector, focusing on the six target governorates. The team will meet and discuss with the contractors assigned to implement key programs, and evaluate the aims, success, and lessons learned in each case. Plans for future donor programming affecting the growth and prosperity of the agricultural sector, particularly that of the IFIs, will be fully factored into account.

(2) Comprehensive assessments in six target governorates

Our chief concern about the ability to conduct a comprehensive assessment in each of the six target governorates has to do with security. The team is asked to visit "remote governorates where al Qaeda terrorists have sought refuge," to evaluate the opportunities for promoting growth in the agricultural sector. The day that the RFP was received by ARD, the U.S. State Department issued a travel advisory for travel to Yemen by U.S. citizens.

Our belief is that travel by U.S. citizens to one or more of the governorates may be restricted during the period of the assessment, and that it is necessary, therefore, to plan out a methodology that does not depend on such visits. Accordingly, we propose to roll out the governorate assessments as follows.

First, we will gather baseline information and identify the principal stakeholders in each governorate (e.g., key policymakers, business leaders, agricultural extension services, and farmers [including women]). Then, select groups of these stakeholders from each governorate will be asked to participate in one-day workshops to discuss the constraints and opportunities that they see as critical for the development of agricultural production and markets in their governorates.

Baseline information will be gathered through meetings in Sana'a with MOA officials, IFIs, and other donor representatives, and visits to the remote governorates. The initial outreach to each governorate will be conducted through field visits by a group composed of the Yemeni Agricultural Specialist and two local surveyors. This group will be trained in structured interview techniques prior to their departure for the governorates. They may or may not be accompanied by expatriate team members, depending on the security situation.

Then, a series of governorate-level workshops with key stakeholders will be held to illuminate and explore critical constraints and opportunities in the agricultural sector. The workshops will focus on subjects ranging from agricultural production, market development and trade, to natural resource management, infrastructure, policy and institutional constraints, and gender



mainstreaming. Representatives of the MOA, universities, input suppliers, processors, and traders resident in Sana'a will be invited to attend. The workshops may be held either in the respective governorates or, depending on the security situation, in Sana'a. In the latter case, we would pay for the travel of governorate stakeholders to Sana'a and provide a stipend to cover their other costs.⁴

The workshops will be held in Arabic, and will be moderated by professional facilitators, with the objective of fully airing views and mediating conflictive viewpoints. The workshops will provide critical information to the team on agricultural production, business, and trade potential and capacity in each of the target governorates.

1.3 Key Tasks and Implementation

Our proposed sequencing of key tasks and their implementation is presented in preliminary form in Chart 1, 'Yemen Assessment Implementation Plan.' These will be refined and finalized in collaboration with USAID staff during the first week of the assessment.

Our proposed Implementation Plan divides the assessment into three overlapping phases. Phase 1 involves Assessment Team preparation and arrival in country. In its first week, the team will conduct initial briefings with USAID, other USG representatives interested in the assessment, and the MOA, and finalize the work plan for the assessment.

In Week 2, the Yemeni team tasked with initial outreach to key stakeholders in the governorates will be trained on the purpose and conduct of the structured interviews that they will carry out. The team will begin the compilation and evaluation of baseline information concerning the performance of the agricultural sector in Yemen and in each of the six target governorates. Phase 1 will continue through the middle of Week 5 of the assessment, with meetings to be held with MOA representatives; other key policymakers; leaders from the business, academic, and NGO communities; IFIs and other donor representatives; and stakeholders resident in Sana'a.

Phase 2 will begin in Week 2, as the outreach team begins to identify key stakeholders to participate in the series of governorate-level workshops. To complete the comprehensive assessment of each governorate within the limited time available, the outreach team will move on to the identification of key stakeholders in the next governorate during the period in which the workshop is being held for the first governorate. This roll-out procedure will continue through Week 5, when the final governorate-level workshop will be completed.⁵

During Phase 3, beginning at the end of Week 5 and continuing into Week 6, the Assessment Team will synthesize the outcomes of the meetings and workshops that have been held, and prepare preliminary findings and recommendations for presentation to USAID, the MOA, and other key stakeholders, as determined by the CTO.

⁴ Note that, if the workshops are held in the governorates, we may still have to pay for the travel and costs of MOA and other stakeholders resident in Sana'a, so the cost differences in the two options are minimal.

⁵ It is our understanding from the RFP and Mission responses to questions that field visits to USAID/Yemen's five target governorates will be conducted; and that Abyan governorate will be assessed separately in collaboration with the Embassy's ECON and USDA representatives.

Our methodology for determining the strengths and weaknesses of the preliminary findings and recommendations of the Assessment Team will be to engage in active listening and discussion with USAID representatives and other key stakeholders, as determined by the CTO. We anticipate that a facilitated workshop setting for the presentation will be the most effective format to utilize for this task.

The Assessment Team will compile a record of the key comments, questions, and suggestions of the participants made during the workshop on preliminary findings and recommendations. These will be taken into account by the Assessment Team members in drafting their field reports. A draft Final Report will be sent to the USAID CTO for review within two weeks of Assessment Team departure from Yemen. The Final Report will be synthesized by ARD and delivered to USAID within one week of receipt of written comments from USAID.⁶

1.4 Deliverables

Chart 1 also outlines briefly the timing of the deliverables of the assessment, by week. The Assessment Team is assumed to arrive in Yemen on or about September 20.⁷ The work plan will be finalized in the first week, and workshops with participants from the USAID/Yemen target governorates will be conducted in Weeks 3 – 5. The presentation of preliminary findings and recommendations will occur in Week 6, and a draft report forwarded to the CTO in Week 8. Ten copies of the Final Report and accompanying annexes will be bound and sent to USAID/Yemen by Federal Express or a similar courier within one week of receipt of written comments from the Mission (here assumed to occur in Week 10). ARD will also provide an electronic copy of the report and annexes to the Mission.

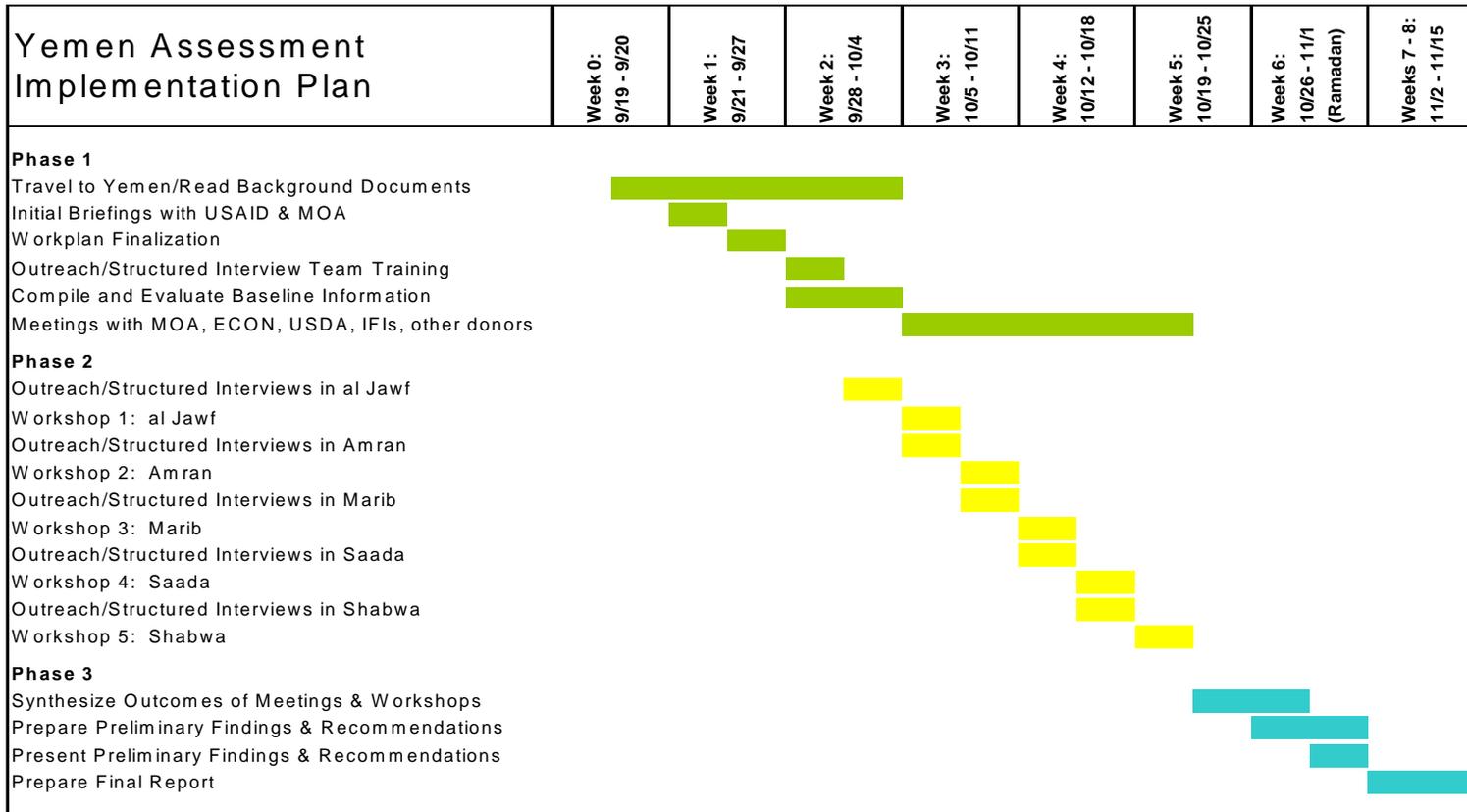
The Final Report will contain five sections, in English, as detailed in the RFP:

Section 1:	Examination of the Ministry of Agriculture
Section 2:	Examination of the Agricultural Sector in each of the Six Governorates
Section 3:	Description and Assessment of Gender Roles and Needs in Agriculture
Section 4:	Examination of the Programs of the IFIs and Other Donors
Section 5:	Recommendations to USAID

An Executive Summary of no more than 10 pages will be included. A complete list of persons interviewed, workshop participants, and citations of all documentary sources will also be presented in an annex.

⁶ We have programmed the equivalent of eight person-weeks for each of four consultants, as anticipated in the RFP, but want the deliverables schedule to reflect the time needed to take USAID comments into account and assemble the reports of each of the consultants into a coherent report.

⁷ The actual start date will depend on the date of contract award, but our target is September 20.



Deliverables

Team Arrival in Country	Week 0
Workplan	Week 1
Workshops with Participants from 5 Governorates	Weeks 3 - 5
Presentation of Preliminary Findings & Recommendations	Week 6
Final Report	Week 8

Dr. James B. Fitch will serve as **Chief-of-Party and Agricultural Production Specialist.**

Dr. Fitch will draft a comprehensive report while in the field not to exceed 20 pages in length, with a 5-page Executive Summary, **on the main agricultural production constraints and opportunities in Yemen as a whole and in each of six governorates.** He will supervise the outreach team responsible for making initial contact with key stakeholders in each of the (5) USAID/Yemen governorates to be visited, and in collaboration with Mr. Mark La Grange, the Agribusiness Development Specialist, he will lead governorate-level workshops with those key stakeholders. He will work with USAID/Yemen to assess opportunities and risks in the Abyan Governorate. He will contribute relevant information to the team members responsible for the gender and to the IFI/other donor sections of the report. He will contribute to the preparation of the assessment team's findings and recommendations, and to their presentation to USAID and other key stakeholders. He will revise his field report based on the comments, questions and suggestions received from USAID during the presentation. Upon returning to the United States, he will be responsible for preparing a draft report of not more than 50 pages in length, incorporating the field reports of all the team members.

Ms. Noubia Gribi will serve as **Agricultural Policy Specialist.**

Ms. Gribi will draft an **examination report while in the field of the Ministry of Agriculture, not to exceed 20 pages in length, with a 5-page Executive Summary.** Her report will be based on interviews and meetings she conducts in Sana'a with the MOA, IFIs and other key stakeholders, and on the results of five-governorate-level workshops. She will also prepare a description and **assessment of gender roles and needs while in the field, based on inputs from all team members,** not to exceed 10 pages in length, with a 3-page Executive Summary. She will contribute to the examination of the programs of the IFIs and other donors, and may attend and contribute to the governorate-level workshops. She will contribute to the preparation of the assessment team's findings and recommendations, and to their presentation to USAID and other key stakeholders. She will revise her field reports based on the comments, questions and suggestions received from USAID during the presentation.

Mr. Mark La Grange will serve as **Agribusiness Development Specialist.**

Mr. La Grange will draft a comprehensive report while in the field not to exceed 20 pages in length, **on the main agribusiness development constraints and opportunities in Yemen as a whole and in each of the six governorates.** He will provide support to the outreach team responsible for making initial contact with key stakeholders in each of the target governorates to be visited, and in collaboration with Dr. Fitch, he will lead the governorate-level workshops. He will contribute relevant information to the team members responsible for the gender and the IFI/other donor sections of the report. He will contribute to the preparation of the assessment team's findings and recommendations, and to their presentation to USAID and other key stakeholders. He will revise his report based on the comments, questions and suggestions received from USAID during the presentation.

Dr. Donaldo Hart will serve as **Agricultural Trade Specialist.**

Dr. Hart will prepare a field report, not to exceed 20 pages in length, with a 5-page Executive Summary, **on the principal constraints to increasing agribusiness trade, and recommendations as to how they may be relived, with a special focus on regional export opportunities.** His report will be based on meetings held in Sana'a with key policy makers, business persons and donor



representatives. He will also draft **an examination of the programs of the IFIs and other donors**, not to exceed 10 pages in length, with a 3-page Executive Summary. He may attend and contribute to some of the governorate-level workshops, as needed. He will contribute to the preparation of the assessment team's findings and recommendations, and to their presentation to USAID and other key stakeholders. He will revise his field reports based on the comments, questions and suggestions received from USAID during the presentation.

Dr. Scott Thomas will serve in the role of **Senior Technical Adviser and Agricultural Policy Specialist**.

Dr. Thomas will arrive in-country with the assessment team and remain there for the first 2 weeks of the assessment. During this period he will hold initial meetings with USAID and other USG representatives, help finalize the workplan for the assessment, train the outreach team, and initiate meetings with the MOA, IFIs, and other key stakeholders in Sana'a. He will ensure that each of the consultants understands his or her scope-of-work and deliverables, and the methodology to be employed to achieve them. He will work with Ms. Gribi to develop a methodological approach and begin implementation of her field assessment of the Ministry of Agriculture. He will return in Week 6, to help synthesize the outcomes of meetings, interviews and workshops into a coherent presentation of preliminary findings and recommendations. He will then ensure that each of the consultants understands the questions, concerns and suggestions that have surfaced during the presentation workshop, so that they can revise their field reports. He will take responsibility for reviewing and finalizing the final report to be prepared by the COP. He will be responsible for management of team finances.

**Annex 2:
People and Organizations Visited**

Yemen Ag Assessment Names and Addresses

Yemen Agricultural Assessment - People and Organizations Visited					
Name	Organization	Position	Address	Phone (1)	Email Address
Doug Heisler	USAID, Yemen	Director		7321-3505	heislerd@state.gov
Garret J. Harries	USAID, Yemen	Project Coordinator	P.O. Box 22347 Sana'a Yemen	967-1-303-155	harriesgj@state.gov
Mohamed Sharaf-Aldin	USAID, Yemen	USDA Coordinator			sharafaldm@state.gov
Quintin Gray	Agri Trade Officer	USDA	Riyadh, Saudi Arabia		
Jack Thomas	Sr. Tech. Advisor, USAID Project	Health Service Catalyst			jackt66@hotmail.com
Scott Christiansen	USAID, Yemen	Sr Ag Dev	Ronald Reagon Bldg 4.09-101	+1-202-712-4584	Schristiansen@usaid.gov
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Annex 3:
Workshop Questions

Questions Submitted at WORKSHOP on Draft Findings and Recommendations

January 25, 2004

Questions related to the First Session – MAI, National Level (for Dr. Dammous)

1. Is there a relationship between the Aden recommendations and your recommendations?
2. Why don't you suggest a fund for small credits though the Agricultural Credit Bank?
3. Did you consider water harvesting in your study? Did you include water harvesting at the rural household level? (Questions by two separate people.)
4. Are there any recommendations for improved marketing techniques?
5. As it is well known the problem is in management. Why don't you suggest or recommend research in management? (Question not clear – does it refer to management within MAI?)
6. The Agricultural Cooperative Union needs support in order to complete infrastructure, both organizational and for production. Why did you not mention support to the ACU?

Questions related to the Second Session – Five Governorates (for Dr. Fitch & Dr. LaGrange)

7. Why provide support only for the 5 Governorates? Why isn't there any support for other Governorates?
8. Why don't we have recommendations about spate irrigation in the 5 Governorates?
9. Rainfall in Marib Governorate is less than 50 ml; how can you recommend rained crops in this area?
10. Is there any plan to support the wheat crop and its marketing?
11. Livestock improvement is a good goal in these 5 governorates but, rangeland improvement is very important to support livestock and should be included as an important goal.
12. Is it possible to have better coordination between donors, to integrate services and achieve effective development?
13. Veterinary extension is a noticeable phenomenon in some districts but agricultural extension is dealing only with the poorest farmers, how can we handle this dilemma?
14. What kind of support is there for local livestock, to preserve poultry strains?
15. Concerning livestock, beekeeping and camels were not mentioned. Why?

Questions related to the Fourth Session – Rural Women (for Dr. Fitch & Dr. Dammous)

16. What kind of support will you provide to women? Would it be training-budget vehicles-sewing machines?
17. Why didn't you mention the role of the Women's Department in the Agricultural Cooperative Union, and in the women's cooperative societies?
18. What facilities and support will be provided to relieve women's suffering? What kind of training?
19. How are we going to convince villagers to allow their women to get educated?
20. Handcrafts need development as a source of income for rural family, especially in Sa'ada and Amran.

Annex 4:
Aden Agenda (Technical Paper)

Annex 4. Aden Agenda and its Implementation, technical paper

TECHNICAL PAPER
(NOT TECHNICALLY CLEARED)

ASSESSMENT SUPPORT OF AGRICULTURAL INITIATIVES FOR
USAID
IN
THE REPUBLIC
OF YEMEN

ADEN AGENDA AND ITS IMPLEMENTATION

Prepared by:

Farouk M. Kassem
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Ministry Of Agriculture and Irrigation

January 2004

1.The Aden Agenda and Status of Its Implementation

1. Why was the Agenda originally proposed?

A workshop concerning “**Future of Agriculture Development in Yemen**” was convened in Aden city during the period 12 through 13 **March 1997**. The purpose of convening such a workshop was “**determination of the future goals and role of the Ministry of Agriculture and Irrigation in provision of the agricultural and rural services**”. An executive work plan resulted from this workshop, which was later named as “**Aden Agenda**”. The Yemeni government has taken significant steps that are worthy of recognition and attention. These steps are aimed at determination and definition of the developmental problems facing the agricultural sector. In this regard, the outputs of “*Aden Agenda*” were already completed and approved. These outputs call for reorientation of the agricultural policies and strategies, restructure of the role and organization of the Ministry of Agriculture and Irrigation and various relevant associations. Based on these grounds and principles, problems facing the agriculture sector will be reconsidered by specifying its priorities and principles applied in the process of specifying the priorities, which, no doubt impose it. This matter is inevitable in the restructure process of the agricultural sector by means of restructuring the following three props: - (i) **Human Resources** (labor force in the Agriculture Sector), (ii) **Financial Resources** (budgeting and disbursements), and (iii) the Core Activity of the Agricultural Sector, which is **field services**.

Furthermore, measures include re-identification of various roles for each framework pertaining to agricultural frameworks and activities within the Ministry of Agriculture and Irrigation and the cooperative sector and identify the levels and available potentialities that would qualify the Ministry of Agriculture and Irrigation and the Cooperative Sector to conduct a specific and clear role in congruence with the needs of the living conditions and economic changes; etc.

The Most Important Factors of Resistance to Changes are:

- i- **Viewpoint of Inferiority and negative attitude** with respect to agriculture and consequently against all rural communities.
- ii- **Low Standard of Employment of Rural Financing Resources.**
- iii- **Declined Efficiency with respect to Utilization of Natural Resources** (Land and Water), in spite of awareness concerning scarcity thereof.
- iv- **Weakness of Institutional Performance**, whether public, private or cooperative, with respect to management of agricultural business.
- v- **Desiccation of the sources of knowledge** in the field of agriculture, and decline of the standards of exploitation of technological knowledge in agriculture.

2. What were the main recommendations of the Agenda for restructuring the MAI and the agricultural sector?

All tendencies, whether in terms of policies or strategies, aim at **achievement of sustainability** of agriculture, **rural development** and **community participation**, and **best utilization of potentialities** that are not mobilized or utilized, and were not subjugated yet. Such tendencies would allow adequate prospects to avoid difficulties and overcome the challenges in achieving the long-term goals and aspirations, which are:

1. **Development of production**, taking into consideration that it is the motivating power for increasing demand to agricultural commodities and services.
2. **Diversification and expansion of the rural economy** by mobilizing numerous rural resources including human resources and renewable natural resources; etc.
3. **Farmers in the first place**, taking into consideration that farmers are the prime objective, who are expected to accomplish and attain the aspirations and hopes of the rural communities, and thus improving the standards of living in rural areas and develop ways of decent living standards.
4. **Sustainability and conservation of the agricultural and rural ecology** for possible utilization in the present and coming generations in the foreseeable future.
5. **Effective governmental interventions** (competent – fairness – selective), and generalization of “centralization of policy and decentralization of administration”.

All these factors maintain projective solutions in the agricultural strategy fields, as outlined in “Aden Agenda”, which we presenting herein in order clarify its importance in the course of confrontation of the **changes resistance factors**:

- **Capable Farmer:** In order to confront the viewpoint of inferiority and negative attitude with respect to agriculture and consequently against all rural communities.
- **Oriented Investment:** To confront Low Standard of Employment of Rural Financing Resources.
- **Suitable Environment:** To confront Declined Efficiency with respect to Utilization of Natural Resources (Land and Water), in spite of awareness concerning scarcity thereof.
- **Strong Institutionalization:** To confront Weakness of Institutional Performance, whether public, private or cooperative, with respect to management of agricultural business, particularly with respect to training programs and motivation of the sources of knowledge and at the same time exploit technological knowledge in agriculture and agricultural technology.

These strategic scopes may also stand against other additional factors that call for resistance of changes.

Against this background the discussions known as the Aden Agenda resulted in a number of resolutions which are supposed to lead to an improvement in the productivity of the agriculture sector. The principles and initial guidelines to re-

address the problems were outlined in the "Aden Agenda" which concentrated on four main areas of attention:

Restructuring and improving the field services to farmers, to be delivered by government, NGOs and the private sector in response to the explicit needs of the farmer

Reorienting the roles and functions of MAI Head Quarters and Offices of Agriculture and Regional Development Authorities as well as other important services to farmers

Restructuring the MAI manpower, elimination of redundant labour force and human resources development

Restructuring the MAI budget, targets and procedures.

The Agriculture 21 Agenda (A21A) is considered a framework for management of changes in the Agricultural Sector. The importance of (A21A) is that it is a practical and logical mechanism and tool for management of the change process, depending on **clear goals** that are specified in the general objectives of the agricultural policy, which include **achievement of increasing growth with sustainability and fairness** with respect to the outputs of the agricultural sector, increase incomes that are depending on agriculture, particularly for the poor segments in rural communities, yet, such identification was a result of implementation of Aden Agenda. **These goals were reflected in:**

- 1) **Food Security:** This is achieved by reaching high standards of food security that depends on local agricultural production of food crops and livestock and by addressing women farmers since they are primarily responsible for those activities.
- 2) **Poverty Alleviation:** by supporting devoted efforts for poverty alleviation of the rural communities in rainfed and irrigated areas, by enabling the communities to access extension/credit/marketing especially for women farmers.
- 3) **Sustainable Development:** by achieving sustainable growth in the agricultural sector with ratios that are not less than the population growth rates, by strengthening the production of farmers.

Furthermore **A21A identified the anticipated components and outputs, and impacts** thereof on the Yemeni agriculture. These **components are summarized in:**

- 1- **Management of the Agricultural Strategy Implementation:** depending on its relevant fields (enablement of the farmer, investment orientation, environment compatibility, institutional building).
- 2- **Restructure of the Agriculture Sector Resources Management** (Financial and Human Resources).
- 3- **Development of the field services**, whether such services that are provided by the government sector or the private and cooperative sectors, or even the services provided by all the three sectors mentioned above.

Based on these components, the implementation process will result in specific outputs and impacts on the Yemeni Agriculture and the direct challenges that stand as blocking stone facing any developmental or progressive scopes. These expected **outputs and impacts** should reflect the clear status of the available potentialities, which in turn, may be oriented, organized and subjugated pursuant to the following:

- ◆ Resources development techniques and utilization technology intensification.
- ◆ Creation of Off-Farm Activities income generating job opportunities.
- ◆ Development of the Agricultural Products Marketing Process and Channels.
- ◆ Introduction of productive alternatives in the Qat Cropping Lands.
- ◆ Adaptation of alternative production technology.

In addition, the document identifies the features of the implementation program in accordance with the A21A framework, determination of tendencies with respect to the implementation procedures and requirements, and monitoring and evaluation of the program.

The agenda aimed at preparation of a framework for structural reform in the agricultural sector. However, two significant documents were developed through such aim. The first document was titled “**Policies and Strategies of the Yemeni Agriculture (Result No.1)**” and the second document was titled as “**Scopes of the Institutional Development of the Agriculture Sector (Result No.2)**”.

The contents of the first document “**Policies and Strategies of the Yemeni Agriculture**” is summarized as follows:

1. It diagnoses the conditions and challenges faced by the agricultural sector and envisaged future visions and conceptions that would extricate such prevailing conditions with all their challenges, including deterioration of natural resources, upon which agriculture depends; in addition to decline of the economic status of agriculture and sensitivity of most people who are associated with the agricultural sector to poverty and hunger.
2. It specified the goals, policies and features of the strategy, taking into consideration its vision that **(the basic principle of the agricultural development process is creation of a capable farmer and develop a new vision with respect to the issue of interventions)**.
3. The document determined the policies that may accomplish food security, poverty elimination and develop sustainable growth.
4. It placed strategy options that may result in achievement of the goal pertaining to increase of cereal production (particularly wheat) and animal production.
5. Work on increasing income from rainfed agriculture and focusing on increasing productivity of irrigated cropping.
6. The document linked between the importance of proceeding through various fields of these options that were reflected in the form of programs within frames that include the overall activities of the agricultural operations, whether in terms of technology and production or finance, investment, human development and programs pertaining to administration development and policy analysis.

On the other hand, the second document “**Scopes of the Institutional Development of the Agriculture Sector (Result No.2)**”, addressed associated issues with the mechanisms of the agricultural activity, whereby it assessed the conditions of labor force in various levels and aspects of the agricultural sector administration. Furthermore, the document referred to the problem of overabundant labor force in the institutions and facilities of the agricultural cadre

and existence of redundant labor force that are in no way affiliated to the agricultural sector. In addition, the document addressed the declined ratio of women involvement in the agricultural field of professions. In addressing such aspects, the document resorted to the available potentialities and resources; and requirements of the job and relevant conformity with the required functional power in various levels. The treatment, however, focused on developing practical solutions, mainly minimizing the overabundant surplus of labor force, within non-fundamental and non-radical positional levels by adopting integral systematic procedures (direct and indirect), such as direct retirement, motivation to retirement, redistribution of redundancy manpower and transfer to the social securities fund; and at the same time, approbation of job classifications and descriptions, use of job cards system, training and re-qualification of cadres in the professional and specialized intermediary posts levels.

This manipulation concluded that it is important to reduce the overabundant labor force surplus to third of the overall total of the existing labor force. In its treatment to dysfunctions and infringes that are associated with the financial resources, the document focused in its proposal for restructure on the huge derangements and ill-distribution of the financial resources (recurrent and investment) among various institutions and utilities of the agricultural public sector (authorities, institutions and offices; etc.), and accordingly reflected in non-approbation of budgets for programs on one hand and domination of non-field operational side on the other, in addition to other reasons specified in the document, including squander and expenditure of funds on projects' units that are virtually considered as suspended and terminated projects.

In addressing this condition, the document proposed pursue of privatization after reaching proper settlement with respect to the conditions of personnel in such units and institutions or otherwise rehabilitation of cadres after restructure.

With respect to treatment and development of the farm services in order to be more capable and effective, the document reached conclusions in **adopting proposals as follows**: -

- 1- Tasks that are related to provision of services should be from other tasks that are related to investment. Such services ought to be in congruence with the general policy. However, adequate support should be rendered in order to be more efficient and effective.
- 2- Consideration of investment projects as activities of specific time period and establish temporary teams for such projects.
- 3- Gradual transformation towards new institutional building.

3. Which of the main recommendations have already been implemented by MAI?

Subsequently, a number of important steps were taken. A National Agricultural Policy and Strategy was formulated. Under the auspices of the World Bank a

number of key studies were undertaken on:

- 1) the Labour Force in the MAI (October 1998),
- 2) Preparation of a Budget and Expenditure Adjustment Program (March 1999)
- 3) Field Services Review (April 1999).

With the beginning of the new millennium the stage was set for turning the well-developed concepts into specific action. Entering the 21st century, this new phase was named "A21A (Agenda 21 for Agriculture)". A high-level Task Force team was formed to plan, direct and monitor the A21A reform process. This Task Force consist of the vice Minister (chairman), the (assistant) deputy minister and the Heads of the directorates of planning, finance, legal affairs, human resources, chairmen of AREA, ACU, CACB .A Co-ordination Unit was established to be on a daily basis responsible for the restructuring process. This Unit has prepared the "**Implementation Planning Matrix**" which specifies the different steps needed for each of the main areas of attention mentioned above.

The Law on Local Administration, which became effective in August 2000, has put even more emphasis on the need for the institutional reform. In this Law many responsibilities which before were with the Central Ministries have been handed over to the governorate and district levels. Implementation of activities is the responsibility of the district or governorate, certainly not the Cnetral Ministries. The civil servants at these governorate and district levels have to report directly to the Governor and thus the newly elected local councils. The role of the central ministries is more confined to policy making, monitoring and evaluation, defining standards of operations and support to the governorate and district administrative units.

It is useful to describe the present situation of implemented recommendations as follows:

1. Establishment of Water and Environment Ministry
2. Transformation budgets of the completed projects to current budgets.
3. Return of the state and cooperative lands to their owners.
4. Privatization of state machinery stations.
5. Transform of some state corporations to private sector and been restructured (Potatoes seed Company, Vegetable Company).
6. Privatization of the vegetable corporation .
7. Privatization of the poultry corporation activity.
8. the corporation of the agricultural services is in the process of privatization.
9. Restructuring of the Date palm factory .
10. The Dairy farms were privatized.
11. Establishment of the water users associations.
12. Establishment of the General association agricultural inputs.
13. establishment of General association for irrigation
14. Decree of the Handling and use of fertilizers and pesticides
15. Providing of Agricultural quarantines low.

16. Decree of water law.
17. Establishment of general association for dairy products .
18. Establishment of Marketing Information System (MIS) .

Agricultural Researches applied by others - University of Aden

Veterinary services is fully provided by private sector and existing services provided by the government concentrating on national combines

19. Plant protection is fully privatized and the government to provided national combines
- 20.
21. Privatizing of drilling corp.
- 22.
23. Agricultural and fishers fund was formed to assist farmers to improving the agricultural production
- 24.
25. Support was provided to ACU by government resources to establish and build Wholesale markets to owned by cooperative members
26. Budgeting is under process .
- 27.
28. Level force down sizing of MAY and its institutions were started with in the civil serves - Moor than 500 persons were retired .
29. Removal of the agricultural inputs prices distortion
- 30.
31. Private sector started working on agricultural extension services especially in pesticides

4. Which recommendations are currently scheduled for implementation, and when are they likely to be completed?

The new agenda (A21A) aims at polarization of Aden Agenda outputs, which are to be interpreted from theoretical visions into a practical program that could be easily implemented, in the course of accomplishment of aspired changes. However, such outputs are to be polarized under the following **major components**: -

3.2.1 Strategy Implementation Management

The Strategy Implementation Management aims at developing appropriate solutions to overcome the most important factors of Changes Resistance in agriculture. These solutions are framed herein in the form of fields of the strategy.

Fields of the Strategy:

The fields of the strategy are represented in (enablement of the farmer – orientation of investment – suitability of environment – institutional strengthening):

Enablement of the Farmer (Capable Farmer):

Capable farmer may exist through the following procedures:

- Development of human resources through training and re-qualification programs.
- Gender equity in the selectivity of target groups.
- Financial and institutional enablement through credit and loans institutions, etc.
- Enforcement of the principle of participation with complete awareness and voluntary basis, covering all fields of rural development.
- Suitability of environment and contribution in costs conformably with the capabilities and potentialities.
- Elimination of rural poverty and need by increasing awareness, provision of infrastructure and develop fields for off-farm activities.
- Integration and enablement of women in the development process.

Orientation of Investment:

Consideration should be given to investment orientation, which should be directed towards:

- Small income generation projects that would provide job opportunities and at the same contribution in increasing the efficiency of resources utilization and support the sector with improved qualitative and quantitative outputs.
- Orientation of governmental investments in fields that would develop necessary infrastructure for the agriculture sector.

Suitability of Environment:

Suitability of environment may be achieved through:

- Provision of taxation and pricing incentives, which is to be associated with legal support.
- Provision of export opportunities and scopes.
- Settlement of the problem with respect to land tenures, to conform to the requirements of the targeted environment.
- Introduction of appropriate technologies that would contribute in minimizing the costs and increasing the ratio of productivity.
- Management of the natural resources (land, water and plants) in scientific methods that would contribute in its conservation and improvement.

Institutional Strengthening

Strengthening of institutions may be achieved through:

- Development of strong institutions that are supported by effective laws, policies, strategies, plans and organizations.
- Provision of adequate information and data, and qualified cadre.
- Preparation and encouragement of farmers in cooperative voluntary activities.
- Provision of relevant potentialities for training and qualification of rural cadre and labor force.
- Increasing concern in modern technologies, which are to be disseminated in various rural communities (men and women).
- Increasing the usage of labor-reducing devices, especially for women farmers.

3.2.2 Restructure of the Agricultural Sector Resources Department

Sector's Resources:

Restructure of the Agriculture Sector Resources is mainly a focus on solving the problems related to human and financial resources, in view of the fact that they are closely related and therefore they are to be treated simultaneously.

3.2.2.1 Restructure of the Human Resources Department:

It aims at utilization of the quantitative and qualitative potentialities, and at the same time development thereof effectively and fairly through:

- Application of a suitable criteria to link between the volume of labor force and the agriculture potentialities and resources in the region that is included

in the services in order to achieve an adequate and suitable ratio with land tenures.

- Distinguish between the relevant personnel and directors providing direct services to the farmer and subsidiary team, in a manner that achieve suitable ratio with the land tenures.
- Refer to pension and encourage early retirement scheme.
- Give attention to recruitment of rare specialization and highly qualified personnel, who are required in the units that are subject to restructure.
- Consider the issue of imbalance between male and female, and give employment opportunities to women of high qualification to work in units that provide direct services to farmers.
- Give adequate attention to qualification and training programs in the process of human resources restructure.
- Transfer and redistribution of labor whenever possible.
- Provision of incentives to improve performance.
- Take necessary measures to improve the conditions of personnel in the governmental institutions that will be included in the privatization program.

3.2.2.2 Restructure of the Financial Resources Department:

Restructure of the Financial Resources Department became inevitable as a result of the adversity of the agriculture sector from inadequacy and inefficiency of the financial resources both in foreign currency or local currency and whether in terms of the short-term, medium term or long terms. Therefore, solution will be based on adopting the following procedures:

- Increasing reductions of operation costs, and improving its efficiency by applying of program budgets.
- Increase of operation expenses with respect to costs of wages and salaries.
- Gradual increase of salaries to reach a general average of US\$. 1,000 (One Thousand American Dollars).
- Increase incentives in order to improve the efficiency of the cadre and increase of revenues.
-

Annex 5:
Balance Sheets

Annex 5. Yemen Food Balance Sheets - Comparison of Production, Trade Balances and Nutrition Status

Product	1980-1981 Average				1990-1991 Average				2000-2001 Average			
	Production	Imports	Exports	Trade Balance	Production	Imports	Exports	Trade Balance	Production	Imports	Exports	Trade Balance
PRINCIPAL CROP PRODUCTS: (1000 metric tons)												
Wheat	78.8	580.8	3.0	(577.9)	127.4	1,243.0	2.4	(1,240.6)	147.3	2,403.5	3.6	(2,399.9)
Barley	51.7	1.0	0.0	(1.0)	42.0	0.0	0.0	(0.0)	44.2	1.7	0.0	(1.7)
Maize	60.4	7.8	0.0	(7.8)	55.8	92.7	0.0	(92.7)	49.0	200.4	7.2	(193.2)
Millet	97.3		0.0	0.0	37.7		0.0	0.0	66.9		0.1	0.1
Sorghum	606.7	1.3	0.0	(1.3)	344.4	10.3	0.0	(10.3)	378.8	0.5	0.1	(0.4)
Cereals, Other	0.0	1.1	0.0	(1.1)				0.0	0.5	0.2	0.5	0.3
Rice (Milled Equivalent)		63.7	0.1	(63.6)		161.4	0.0	(161.4)		217.4	0.0	(217.4)
Potatoes	140.5	4.1	0.3	(3.8)	158.5	3.0	0.0	(3.0)	209.5	2.9	0.9	(2.0)
Sugar (Raw Equivalent)		150.0	0.6	(149.4)		243.4	0.2	(243.2)		456.7	0.5	(456.2)
Pulses	79.8	2.2	0.0	(2.2)	59.7	13.1	0.0	(13.1)	63.6	45.7	0.0	(45.7)
Sesameseed	8.5	14.5	0.0	(14.4)	8.7	13.0	0.3	(12.7)	18.9	8.9	0.1	(8.8)
Cottonseed Oil	1.6	0.2	0.0	(0.2)	0.8	0.0	0.0	0.0	2.9	0.0	0.0	0.0
Palm Oil		11.9	0.0	(11.9)		86.2	0.0	(86.2)		126.0	0.6	(125.4)
Tomatoes	112.5	15.9	0.0	(15.9)	169.6	21.5	0.0	(21.5)	256.4	0.0	1.4	1.4
Onions	27.4	0.0	0.0	0.0	64.6	0.0	0.0	0.0	76.9	0.1	11.5	11.4
Vegetables, Other	193.2	24.8	0.3	(24.5)	275.3	13.6	14.1	0.5	265.2	14.8	12.4	(2.4)
Oranges, Mandarines	4.0	28.0	0.0	(28.0)	14.6	0.6	0.0	(0.6)	181.9	0.4	0.9	0.5
Lemons, Limes	3.2	0.3	0.0	(0.3)	6.3	0.0	0.0	0.0	8.9	0.0	0.1	0.1
Bananas	24.1	33.8	0.0	(33.7)	51.0	0.0	0.0	0.0	93.0	0.0	24.7	24.7
Apples	0.1	29.8	0.0	(29.8)	0.9	0.1	0.0	(0.1)	2.5	0.6	0.0	(0.6)
Dates	15.5	12.7	0.1	(12.6)	20.8	3.5	0.0	(3.5)	30.7	12.6	0.2	(12.4)
Grapes	59.8	0.2	0.0	(0.2)	140.5	0.0	2.9	2.9	159.3	0.0	3.7	3.7
Fruits, Other	67.0	53.6	3.7	(49.9)	80.5	42.0	0.0	(42.0)	129.3	12.8	8.5	(4.3)
Coffee	4.4	0.7	0.4	(0.4)	6.4	0.0	3.2	3.2	11.6	0.2	4.0	3.8
PRINCIPAL LIVESTOCK PRODUCTS:												
Bovine Meat	34.1	1.5	0.0	(1.5)	37.4	2.6	0.0	(2.6)	53.9	4.2	0.0	(4.2)
Mutton & Goat Meat	30.6	1.2	0.0	(1.2)	39.2	4.0	0.0	(4.0)	47.9	0.4	0.0	(0.4)
Poultry Meat	6.9	47.2	0.1	(47.1)	37.1	11.0	0.0	(11.0)	72.5	47.1	0.0	(47.1)
Fats, Animals, Raw	3.5	10.5	0.0	(10.5)	4.3	0.3	0.0	(0.3)	5.4	0.0	0.0	0.0
Butter, Ghee	2.0	3.4	0.1	(3.3)	3.8	1.0	0.0	(1.0)	4.7	2.7	0.0	(2.7)
Honey	0.1	0.6	0.0	(0.6)	0.1	0.6	0.3	(0.3)	0.2	0.7	0.2	(0.5)
TOTAL CROP PRODUCTS:												
Cereals	894.9	655.8	3.1	(652.7)	607.3	1,507.4	2.4	(1,505.0)	686.7	2,823.7	11.6	(2,812.1)
Starchy Roots	140.5	4.1	0.3	(3.8)	158.8	3.0	0.0	(3.0)	209.9	2.9	0.9	(2.0)
Sugar & Sweeteners	0.1	152.7	0.7	(152.0)	0.1	245.1	0.5	(244.7)	0.2	460.6	0.6	(460.0)
Pulses	79.8	2.2	0.0	(2.2)	59.7	13.1	0.0	(13.1)	63.6	45.7	0.0	(45.7)
Treenuts	0.0	0.1	0.0	(0.1)	0.1	0.0	0.0	0.0	0.1	5.1	0.0	(5.1)
Oilcrops	18.4	20.2	0.0	(20.2)	13.7	30.0	0.3	(29.7)	37.6	47.8	1.1	(46.7)
Vegetable Oils	8.2	27.0	0.1	(26.9)	7.0	95.5	0.0	(95.5)	10.9	141.6	0.6	(141.0)
Vegetables	333.1	40.7	0.3	(40.4)	509.5	35.1	14.1	(21.0)	598.5	14.9	25.3	10.4
Fruits	173.7	162.7	3.8	(158.9)	314.6	50.1	2.9	(47.2)	605.7	26.4	38.2	11.8
Stimulants	4.4	7.8	0.4	(7.4)	6.4	8.7	3.2	(5.6)	11.6	10.5	4.1	(6.4)
Spices		3.1	0.0	(3.1)		1.9	0.0	(1.9)		4.0	0.1	(3.9)
Alcoholic Beverages	17.6	9.1	0.0	(9.1)	13.1	2.0	0.0	(2.0)	14.3	0.3	0.0	(0.3)
TOTAL ANIMAL PRODUCTS:												
Meat	73.8	50.7	0.2	(50.6)	116.1	17.6	0.0	(17.6)	177.2	51.8	0.0	(51.8)
Offals	13.2	0.5	0.0	(0.5)	15.6	0.2	0.0	(0.2)	20.6	0.1	0.0	(0.1)
Animal Fats	6.0	13.9	0.4	(13.5)	8.2	1.3	0.0	(1.3)	10.1	2.7	0.0	(2.7)
Milk - Excluding Butter	100.7	274.3	1.4	(272.9)	187.3	334.5	4.1	(330.4)	231.3	327.7	2.7	(325.0)
Eggs	7.4	7.1	0.1	(7.0)	17.8	3.0	0.0	(3.0)	31.4	9.0	1.6	(7.4)
Fish, Seafood	74.8	9.2	6.2	(3.0)	79.9	3.0	3.3	0.3	128.5	7.9	27.4	19.5
SATUS OF HUMAN NUTRITION, based on total food supply												
	Availability per Capita				Availability per Capita				Availability per Capita			
	Calories	Proteins	Fats		Calories	Proteins	Fats		Calories	Proteins	Fats	
	(grams)	(grams)	(grams)		(grams)	(grams)	(grams)		(grams)	(grams)	(grams)	
Total	1,944.7	58.4	37.0		2,011.3	56.0	34.8		2,045.6	57.5	37.2	
From Crop Products	1,733.6	44.9	22.8		1,862.5	44.9	25.6		1,912.5	47.4	28.6	
From Animal Products	211.0	13.5	14.2		148.8	11.2	9.3		133.0	10.1	8.6	

Source: FAO, FAOSTAT, <http://apps.fao.org/lim500/wrap.pl?FoodBalanceSheet&Domain=FoodBalanceSheet&Language=english>

Annex 6:
Focus Group Questions and Issues Discussed

Annex 6. Focus Groups: Questions & Issues Discussed

1. Farm Women
2. Farmers
3. Community Leaders

1. Farm Women Focus Groups – Issues to Discuss

1. What are the main problems that women crop and livestock farmers in this area face?
(List / prioritize)
Any problems with or comments on:
 - ↑ Availability of inputs?
 - ↑ Credit availability?
 - ↑ Marketing problems?
 - ↑ Livestock production problems?
2. Adequacy of food availability.
 - a. What proportion of families experience occasional hunger?
 - b. What time of year does it usually occur?
 - c. How long does it last?
3. Agricultural extension.
 - a. Discuss the types of problems and needs that agricultural extension and women extension agents might be able to do to help farm women address their needs. (List / prioritize)
 - b. Considering that it is often difficult for women to leave family farm, or for women to travel on their own, what are the most effective ways for extension agents to reach them?
 - c. Is there a women's association or other woman's organization in this district?
4. What are the best media for women to receive market and extension information?
 - a. Is radio likely to be effective?
 - b. Do women in your area listen to agricultural programs on radio?
 - c. What proportion of women in your village have a radio?
 - d. Is television likely to be effective?
 - e. Do women in your area listen to agricultural programs on television?
 - f. What proportion of women in your village have a television?
 - g. If special video programs on crop and livestock production were shown at extension centers or in village meetings, would women be able to attend?
5. Discuss the meaning of households with "women in charge". [the woman (mother, farmer's wife) is a widow, the husband is away working, etc.]
 - a. What proportion of the farms in your area have women in charge?
 - b. What are the special problems and needs of these households with women in charge?
6. For those households where one or more of the men are away from the farm, working in Saudi Arabia, Oman, Sana'a, or some other place, what proportion of the men send or bring money back home to help support the family?
(e.g. less than one quarter, less than half, more than half, more than three quarters)
 - a. Of those remittances sent or brought back home, what proportion is used for day-to-day living expenses, and what proportion is kept for savings or investment?
Consumption _____ %
Saving or investment _____ %
 - b. What is the most common use of savings or investment funds?

2. Farmer Focus Groups – Issues to Discuss

1. What are the main problems that crop and livestock farms in this area face? (List / prioritize)
Any problems with or comments on:
 - ↑ Availability of inputs?
 - ↑ Credit availability?
 - ↑ Marketing problems?
 - ↑ Livestock production problems?
2. Adequacy of food availability.
 - a. Proportion of families that experience hunger?
 - b. What time of year does it usually occur?
 - c. How long does it last?
3. Agricultural extension.
 - a. What are the most important ways in which extension agents can help or support farmers in this area?
(List / prioritize)
 - b. What is the best way in which to organize groups of farmers to make it easier for extension agents to reach farms?
Is there a cooperative or other farmers' organization in this district?
 - c. Best size for groups to work with extension (how many members)?
Where and when should these groups meet?
4. What are farmers sources of market information?
 - On local markets (district and governorate)?
 - On national and export markets?
5. Best media for farmers to receive market and extension information?
Is radio likely to be effective?
 - a. Do farmers in your area listen to agricultural programs on radio?
 - b. What proportion of farmers in your village have a radio?
 - c. Is television likely to be effective?
 - d. Do farmers in your area listen to agricultural programs on television?
 - e. What proportion of farmers in your village have a television?
 - f. If special video programs on crop and livestock production were shown at extension centers or in village meetings, would many farmers attend?
6. Discuss the meaning of households with “women in charge”. [the woman (mother, farmer's wife) is a widow, the husband is away working, etc.]
 - a. What proportion of the farms in your area have women in charge?
 - b. What are the special problems and needs of these households with women in charge?
7. For those households where one or more of the men are away from the farm, working in Saudi Arabia, Oman, Sana'a, or some other place, what proportion of the men send or bring money back home to help support the family?
(e.g. less than one quarter, less than half, more than half, more than three quarters)
 - a. Of those remittances sent or brought back home, what proportion is used for day-to-day living expenses, and what proportion is kept for savings or investment?
Consumption _____ %
Saving or investment _____ %
 - b. What is the most common use of savings or investment funds?

3. Community Leader Focus Groups

1. What are the main problems that farmers (crop and livestock producers) in this area face? (List / prioritize)
Any problems with or comments on:
 - ↑ Availability of farm inputs?
 - ↑ Availability of farmer credit?
 - ↑ Marketing problems?
 - ↑ Livestock production problems?
2. Is there a cooperative or other farmers' organization in this district?
 - a. What other groups or organizations support farmers?
2. How is the need for "projects" (water projects/ roads/ public buildings, etc.) identified in this district?
 - a. How is the funding obtained?
 - b. Are there any problems with this process?
3. Adequacy of food availability.
 - a. Proportion of families that experience hunger?
 - b. What time of year does it usually occur?
 - c. How long does it last?
 - d. What types of malnutrition have been identified in the area? How widespread are they?
4. Agricultural extension.
 - a. What are the most important ways in which extension agents can help or support farmers in this area? (List / prioritize)
 - b. What is the best way in which to organize groups of farmers to make it easier for extension agents to reach farms?
5. Best size for groups to work with extension (how many members)?
6. Where and when should these groups meet?
7. Best media for farmers to receive market and extension information?
 - a. Is radio likely to be effective?
 - b. Do farmers in your area listen to agricultural programs on radio?
 - c. What proportion of farmers in your village have a radio?
 - d. Is television likely to be effective?
 - e. Do farmers in your area listen to agricultural programs on television?
 - f. What proportion of farmers in your village have a television?
 - g. If special video programs on crop and livestock production were shown at extension centers or in village meetings, would many farmers attend?
8. Discuss the meaning of households with "women in charge". [the woman (mother, farmer's wife) is a widow, the husband is away working, etc.]
9. What proportion of the farms in your area have women in charge?
10. What are their special needs?
11. For those households where one or more of the men are away from the farm, working in Saudi Arabia, Oman, Sana'a, or some other place, what proportion of the men send or bring money back home to help support the family? (e.g. less than one quarter, less than half, more than half, more than three quarters)
 - a. Of those remittances sent or brought back home, what proportion is used for day-to-day living expenses, and what proportion is kept for savings or investment?
Consumption _____ %
Saving or investment _____ %
 - b. What is the most common use of savings or investment funds?
12. What else do you want to tell us?

**Annex 7:
Field Survey**

ANNEX 7. RURAL WOMEN DEVELOPMENT GENERAL DIRECTORATE (RWDGD) OUTLINE FOR PROPOSED COOPERATION BETWEEN USAID AND THE RWDGD

1.0 THE RURAL WOMEN DEVELOPMENT GENERAL DIRECTORATE

1.1 A Brief History

As early as 1986 the Ministry of Agriculture and Irrigation (MAI) installed the Rural Women Development Directorate (RWDD) to further the attention for gender issues in the Ministry. The RWDD started in Sana'a, with a staff of three and, in fact, limited room to manoeuvre. In 1999 the RWDD was upgraded to the RWDGD to allow the director to participate in policy meetings in order to signal the relevance of gender specific actions at the appropriate levels. A second phase of the Netherlands support (2000–2003) ended in April 2003. It was followed by an extension till the end of 2003, after which Netherlands assistance will stop.

The first phase of the Netherlands assistance to the RWDD started in 1996. The Netherlands assistance comprised of capital investments and technical assistance. Much attention was paid to institution building, human resource development, upgrading offices, and improving operational facilities.

By now, the RWDGD had opened field offices (RWDDs) in almost all the governorates of the country. The RWDGD and the RWDD have trained staff in all offices, and the refurbishing of the office facilities in the various governorates is well under way. For an overview of the achievements see the table at the end of this Annex.

The strengths of the RWDGD can be summarized as:

- Well embedded in, and supported by, the Government of Yemen (GOY) (see Organigram).
- A presence in majority of the governorates.
- Availability of gender-sensitive trained staff at the national and local levels.

1.2. Mandate of the RWDGD

Working from within the MAI, the RWDGD has been given the mandate to, and is responsible for, “promoting gender-sensitive agricultural policies, strategies, programs, and projects that are conducive to attaining sustainable agricultural development and food security.”

The RWDGD can operate inside and outside the MAI as long as it aims at rural women.

1.3 The Strategies Followed

To fulfill its mandate the RWDGD has adopted the following set of strategies and lines of action:

1.3.1 In the field of policy development

- Participate in preparing MAI's policies and strategies with regard to the economic role of the rural women in the agricultural sector.
- Participate in preparing the policies and strategies of the concerned General Directorates to guarantee support of the economic role of women.
- Setting priorities according to the needs of the geographical areas and present them to the authorities concerned.

1.3.2 In the field of project and program planning and execution

- Participate in planning programs and projects of developing the rural women: executed by the sections concerned with rural women and associations and according to the policy and strategy of the Ministry.
- Monitoring and evaluation of plans and programs of the sections of the RWDD through the offices of the MAI to guarantee the execution and strategy of the Ministry.
- Finding marketing channels for the products of rural women through coordination with the partners concerned.
- Studying and following up the problems and obstacles in the field and discussing these with the concerned authorities in the Ministry to find a suitable solution.

1.3.3 In the field of coordination and cooperation

- To have contacts with the authorities concerned with the development of rural women and working amongst the focal point of the donors and international organizations.
- Coordination and cooperation with the concerned authorities (government, NGOs, and international organizations) to obtain the support for the programs and projects for the development of rural women.
- Coordinate with the general authorities for research and extension, for training and the preparation of cadres and setting the priorities for research in relation with the programs of the development of rural women.

2.0 POTENTIAL COOPERATION WITH USAID

USAID is in the process of formulating project activities in five governorates: Al-Jawf, Amran, Mareb, Sa'ada, and Shabwah. The intended target group is the rural population, including a specific emphasis on women.

In view of its mandate as well as its established strengths and presence in most of these governorates, cooperation between USAID and the RWDGD seems to be a logical step.

The RWDGD would be able to help establish activities that:

- Can be started in a relatively short time.
- Need little time to show tangible benefits for the target population.
- Would alleviate the burden in the daily lives of the rural women in Yemen.
- Provide additional gender-specific information on agriculture (and other fields) to the rural areas.

3.0 PROPOSED PROJECT

The RWDGD has drafted the following outline for a project proposal aiming at improving the living and working conditions of rural women in Yemen.

3.1 Justification for the Present Proposal

Women are the main stay in (subsistence) agriculture, accounting for 60% of the crop-labor and 90% of the labor in livestock. They also bear the brunt of all household tasks, childcare, and family care. Every day they spend hours collecting water, fuel wood, and fodder for the animals

that are also their responsibility. These tasks are not only long; they are often very heavy, as the only means of transport is in many cases the women's back.

To allow women to improve their situation, the first thing that has to be done is to reduce their workload. That is why the RWDGD is giving high priority to providing the less fortunate with devices and tools that will make their tasks lighter and shorter. Once that is realised we can hope to assist them with educating them selves and engaging in more income generating activities.

3.2 The Target Group

To get some idea of the possible magnitude of the project and the size of the target group, Table 1 presents some population figures (after the statistical yearbook) for the five governorates.

Table 1

Governorate	Total Population	Rural Population
Mareb	241,200	212,000
Al-Jawf	461,400	403,200
Sa'ada	633,900	554,400
Amran	1,033,300	894,500
Shabwah	484,400	428,500
Total	2,854,200	2,492,600

Table 1 shows that more than 80% of the population in these governorates lives in the rural areas. As the average household in the rural areas has about 7.5 members, there are about 380,000 families in the 5 governorates together. To address this entire target group would require very large sums of money and a long period of time. Therefore, to narrow down the target group the following is proposed. In many rural families the husbands are migrant laborers. In their absence the women are responsible for all economic activities. It is proposed that the project aims specifically at these families.

On the basis of the assumption that in about 50% of the families the husband is absent, and assuming the project must reach 10% of these (i.e., 5% of the total number of households) to have any noticeable impact, the number of families to reach will still be 19,000. This is about 3,000 families per governorate. It is understood that the project duration foreseen by USAID is three years. This means that the average number of families to be reached by the project in each governorate is 1,000 per year. This is still a formidable number, and the project's first year will learn whether it is realistic in view of the implementation capacity in the areas.

To decide which of the families would merit assistance from the project, the RWDGD will set up a mechanism for decision-making at the local (village) level in which women have the main say. This mechanism will result in a commonly agreed-on ranking of the eligible families in each village.

3.3 Project Activities

In the course of 2002 the RWDGD commissioned a study on "Time and Labour Saving Devices for Rural Women." The study took place in the rural areas of Dahmar, Lahej, Abyan, Taiz, and Mahweet. This study identifies a number of problems women in the rural areas are facing on a

daily basis and indicates a number of possible solutions. Table 2 presents a summary of the findings of study.

Table 2. Summary Chores of Rural Women, Problems, and Solutions (based on the Report “Time- and labour saving devices for Rural Women”)

Daily Chores of Rural Women	The Problems	Possible Solutions, Depending on the Area	Available in Yemen	Roughly Estimated Cost per Unit
Fetching water ¹	Long distances (time) Heavy transport	Rainwater harvesting from roofs	Yes	70,000 YR
Forage collection ¹	Bad tools for cutting Heavy transport (time)	Improved tools	Yes	3,600 YR/fam
Hand feeding dairy cows	Cows will not eat dry sorghum stalk. They have to be wrapped in alfalfa and hand fed to the cows.	Chopping of fodder by means of a chaff cutter Feeding troughs; using bone ash.	? (India) yes	
Watering farm animals ¹	Long distances (time) Heavy transport	Dig water tanks ² Roofing animal sheds	Yes Yes	
Milking ¹	Uncomfortable position Unhealthy surroundings Little milk	Raised platform Fixings for goats Ventilating stables More water for the animals	Yes	1,000 YR
Churning milk	Time consuming (1 hour daily)	Electric milk churner, using trad. Gourd Hand milk churner, using trad. Gourd	yes	10,000 YR
Providing fuel	Long distance (time) Difficult cutting/uprooting Heavy transport	Bio gas plants ²	Yes	75,000 YR
Poultry keeping ¹	Low yields and loss of chicken and eggs	Improved housing/ Incubators		10,000YR
Grinding flour	Heavy, requiring much time and energy.	No solution yet		

¹Possible early implementation.

²Possibilities for common use (more than one family) must be considered.

The relevance of these subjects will have to be checked during a survey proposed in all the 5 governorates. Although it is very likely that some of these problems will come up, the survey will be needed because of the different climatic and geographic conditions in the 5 governorates mentioned above.

Also it must be noted that for some of the problems ready solutions exist in some areas (where there is electricity) and not in others.

3.4 A Plan of Action

To ensure that the final project proposal answers the needs of the rural women in the five governorates, the following action plan is proposed (Table 3):

Table 3 Plan of action

Activity	Responsible	Time Frame	Start Date	Cost
Survey, a visit to each of the five directorates to discuss with groups of women what their most pressing needs are.	RWDGD and RWDD	6 weeks	01/0/304	PM
Establishing communications between field offices RWDD and head office RWDGD by intranet.	RWDGD/USAID Contractor	4 weeks	01/03/04	US \$75,000
Based on the outcome of the survey acceptable solutions must be identified.	RWDGD/RWDD USAID	2 weeks	15/04/04	
Identify implementing organization for construction and distribution (NGO).	RWDGD/USAID	8 weeks	01/03/04	
Identification of suppliers, contractors, providers.	RWDGD/Impl. Organization	8 weeks	01/05/04	
Start setting up the local systems for selection of the individual families that will benefit from the project.	RWDGD/RWDD and local organization	duration of the program	01/05/04	
If needed build prototypes	Pm	Pm	01/05/04	
Set up an information campaign make leaflets visit all villages discuss with local authorities on the distribution system set up a monitoring and administration system Radio programs*	RWDGD and RWDD in five governorates	duration of the program	01/05/04	US \$330,000
Distribution of radios*				US \$50/pc
Train field staff of the RWDGD in the specific solution	RWDGD		15/04/04	
Start distribution/delivery			01/08/04	

*The reasons for choosing radio instead of television are:

The radios we have in mind do not need batteries but can be "hand-cranked". These can be used in areas where no electricity is available and batteries are hard to get (or too expensive)
Televisions are too expensive and need electricity. In addition, the men often decide the choice of the television programs watched.

In the final project document detailed work plans will be provided for each governorate.

3.5 Budget

A proposed budget of US \$6 million in USAID funds would be used over a period of three years as follows (in US \$):

RWDGD central administration:

- Communications -intra-net for head office RWDGD-field offices RWDD (this is a one-time investment): 75,000

▪ Other RWDGD expenditures for three years are estimated as follows:	
▪ Staff training and monitoring: 50,000/year	150,000
▪ Information campaign (five governorates): 110,000/year	<u>330,000</u>
▪ Total RWDGD over the project period	555,000
Funds to improved technologies to benefit families, with specific emphasis on items (Table 2 above) that are of direct assistance to women	<u>5,445,000</u>
▪ Total budget	6,000,000

The US\$ 5,445,000 funding for improved technologies for the 19,000 families is based on an average of about US \$285/family. With this amount per family, more costly items like rainwater harvesting and bio-gas would probably still require a substantial contribution from the beneficiaries, or alternatively they would have to serve many families.

3.6 The Project Modalities

3.6.1 *The role of the RWDGD*

The role of the RWDGD will be that of raising awareness, training, and providing information. It will also organize and supervise the process of selecting the beneficiaries at village level.

The RWDGD will also decide with local organizations on the level of contribution of the beneficiaries. This may mean that additional training of its office staff will be needed—most of all, practical project-oriented training. This training should not be limited to the agricultural components of the interventions, but may also address issues related to health and the environment.

3.6.2 *Role of NGOs*

A cooperation will be forged with one of more organizations (NGO's) that can manage (supervise) contracts with suppliers and monitor the actual implementation of the activities (construction, distribution of tools).

3.6.3 *Role of local population*

In the implementation of the project, local manpower available in the governorates must be mobilised as much as possible. Therefore it must be considered to encourage (or set up) local enterprises that assist in the implementation of the project, thus creating jobs and income in the areas. In that way repairs and maintenance can be taken care of at the local level, thus assuring sustainability.

Annex 1: Overview of RWDD and RWDD offices, personnel and activities

No.	Locations of RWDD	Office Rehabil.	No Staff	Training and Studies (see below)
1	Women section—forestry	no	1	
2	Haraz (Women Directorate N.A.)	planned	3	2,4,6,
*3	Amran (Women Directorate N. A.)	planned	4	1,2,S4,
*4	Mareb Governorate	completed	9	1,2,4,6,
5	Al-Mahweet governorate	completed	7	1,2,3,4,6,7,8,S1
6	Al-Hodeidah Governorate Tehama Bagel center Zabeed center Mowor center	completed	7 20 19 20	1,2,4,6,S4
7	Taiz Governorate	completed	6	1,2,3,4,7,8,S1,S4,S5
8	Ibb Governorate	completed	5	1,2,3,4,5,6,8,S4,S5
9	Dhamar Governorate	planned	5	1,2,4,6,S1,S4,S5
10	Aden Governorate	completed	3	1,2,3,4,5,6,7,S4
11	Laheg Governorate	completed	9	1,3,4,5,6,8,S1,S4,S5
12	Abyan Governorate	completed	12	1,2,3,4,5,6,8,S1,S4,
*13	Shabwa Governorate	completed	5	1,3,7,S4,S5
14	Sayun	completed	2	1,2,3,6,7,S2,S4,S5
15	Socotra	planned	2	Programs by France
16	Al-Baida Governorate	no		1,
17	Al-Mahrah Governorate	planned	2	1,2,4,6,
18	Al-Dalah	planned	2	1,4,
*19	Al-Jawf Governorate	planned	1	
20	Haja Governorate	no		
21	Al-Mukallah	planned	1	7,
*22	Sa'ada Governorate	planned		
23	Sana'a	completed	9	1,3,4,5,6,

*Governorates targeted by USAID

The numbers indicated in the column training activities refer to the following:

Training

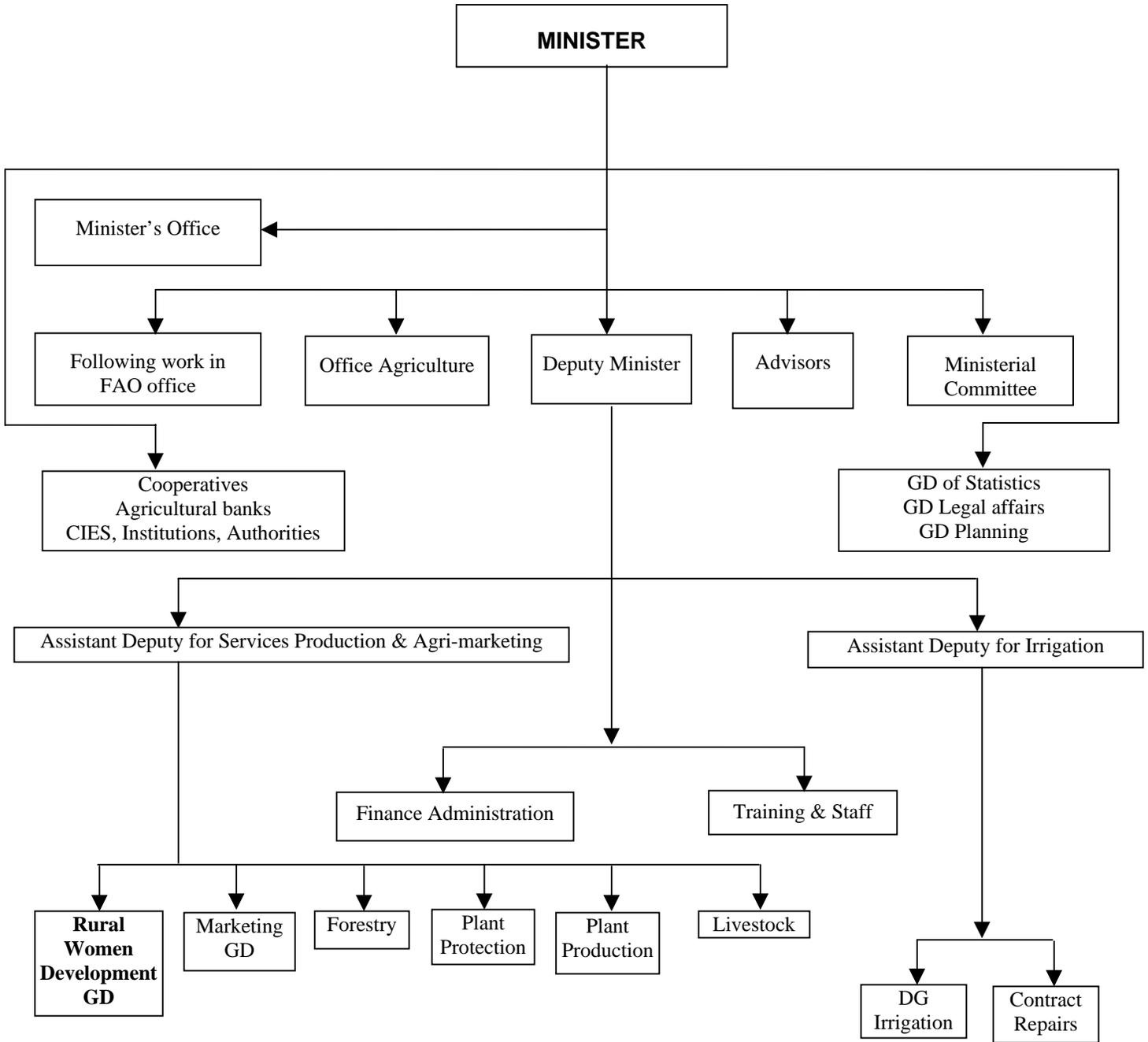
- Gender in agriculture and food security
- Advocacy lobbying networking and communications
- Gender-sensitive monitoring and evaluation
- Gender-sensitive management and program planning
- Gender concepts, planning cycle, and M&E (for ext. agency)
- Strategic planning for gender policy on agriculture and food security
- Capacity building gender-sensitive PRA, theory and practice
- Data collection & analyses

Studies

- S1 Mapping exercise time and labour saving devices
- S2 Study rural women needs in co-operative of La Soum/Sayun
- S3 Study preparations data collection on Marketing rural products
- S4 Study on animal production in Yemen
- S5 Study on post-harvest technologies

Organogram

Ministry of Agriculture and Irrigation



Annex 8:
Constraints and Program Opportunities

**Annex 8. Constraints and Program Opportunities in Marib, Al-Jawf, Amran, Sa'ada and
Shabwah Governorates**

**Technical Paper
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January-2004

**Constraints and Program Opportunities in (Marib, Al-Jawf, Amran, Sa'dah
and Shabwah Governorates)**

Highlight & Introduction:

This report will cover five governorates of the Republic of Yemen include: Marib, Al-Jawf, Amran, Sa'ada, and Shabwah by which Marib and Al-Jawf are located at the eastern region toward the empty quarter (140,170 Km far from the capital Sana'a), while Amran and Sa'ada are located at the northern region of the country toward Saudi Arabia (60,242 Km far from Sana'a respectively), and Shabwah and governorates are located at the southern region of the country toward the coastal plain of the Arabian Sea (413,489.5 Km far from Sana'a respectively).

Amran Governorate was recently established and has the highest population in these five governorates. However, since this governorate is newly established, it is very difficult to get its data and information separately which seems to be under processing. In general the governorate has the most high-grade soil in the five governorates, but their utility is determined by water availability. A special wadi known as Al-Bawn Valley, that is famous for producing cereals (especially wheat) and vegetables (especially potato, tomato and onion). In general, all governorates show a scarcity of water and highly scares at Amran and Sada'ah governorates.

The eastern region has an authority called Eastern Rural Development Authority by which covers Marib and Al-Jawf Governorates, while the northern region (Amran & Sa'dah) is covering by the Northern Rural Development Authority.

- The Total Numbers of Holders and the Agriculture Area.
- The Total Numbers of Holders.

The total number of the holders in the five governorates (without Saada, because still, the data included within Sanaa Governorate) is about (92171) while the total number in the republic is (1,115,515) holder, or this number as represent approx.8.3% of the total in the country. (Agricultural statistics year book 2002).In this regard Saada governorate ranges first with total number of holders about (41,276) holder, second come Shabwah governorate with (25,843) holder, followed by Mareb governorate with total number (14,488) holder, last come Al-Jawf governorate with a total number about (10,564) holder.

- The total cultivable Agriculture Area :

The total cultivable Agriculture area of the five governorates is about (371,701) hectares, this represent about (22.2%) of the total cultivable area in the republic which is about (1,668,858) hectares.

According to this figures the five governorates range as following:

First come Amran governorate with a total cultivable agriculture area (128,682) hectare. in the second place come Mareb governorate with a total cultivable area (91,910) hectares, followed by Al-Jawf governorate with total cult- area (69,549) hectares, fourth come Saade governorate, with total cultivable area (61,030) hectares, in the last place ranged Shabwah governorate - with total cultivable area (21,215) hectares.

- The cultivated area in the five governorates:

The total cultivated area of the five governorates is a bout (258,040) hectare, which represent about 22.7% of the total cultivated area in the republic, which is about (1,133,480) hectares.

In this regard governorate of Mareb range first with total cultivate area about (79,132) hectares, second come Amran Governorate with (66,168) hectares , followed by Saada, with (55,221) hectares fourth ranged Al-Jawf Governorate with (48,185) hectares, last come Shabwah Governorate with total cultivate area (9,332) hectares.

- **Uncultivated Area in the five Governorates:**

As indicate the statistical data, the total uncultivated area in the about mentioned governorates reached about (113,661) hectares, which represent about (31%) of the total cultivable area within the five governorates and about (44%) of the total uncultivated area in the five governorates.

In this connection, the five governorates ranged, first Amran Governorate (we found data regarding this indication) in the agricultural statistical year book 2002 and in the statistical year book of 2002) with total uncultivated area (62,504) hectares, second ranged Al-Jawf Governorate with (21,409) hectare, third come Mareb Governorate, with total uncultivated area of (12,056) hectares, fourth come Shabwah Governorate with (11,883) hectares, and last come Saada Governorate with uncultivated area (5809) hectares.

- **The crop production groups are considered the main five groups as documented, namely:**

- 1-Cereal Group
- 2-Vegetable Group
- 3-Fruit Group
- 4-Pulses Group
- 5-Cash crops Group, and
- 6-Fodder Group.

The important point in this regard is the distribution of the cultivated agriculture areas according of water irrigation source. In this regard they are:

First: Rain-fed Dependable Areas

The total rain-fed areas in this regard in the five governorates are approx. about (90,170) hectares, represents about 27.9% of the total country rain-fed areas which is about (322,736) hectares. The five governorates ranged as shown in the Tab (1):

Tab 1: Distribution of the rain-fed area in the five governorates and their arrangement according the size

Tab (1)		data for 2002
Governorate	Area (Ha) - Year	The country level
Amran	N,A	322,736
Mareb	37,193	
Saada	25,954	
Al-Jawf	22,647	
Shabwah	4,376	
Total	90,170	

Second: Well-Irrigation Dependable Areas

Tab(2) shows the arrangement of the governorates in respect

Tab 2

Governorate	Area (Ha) Year 2002	The country level
Amran	N. A	430,722
Mareb	30,071	
Saada	20,984	
Al-Jawf	18,310	
Shabwah	3,546	
Total	72,912	

Third: Flood irrigation Dependable Areas

Tab (3) shows the arrangement of the governorates in respect.

Tab 3

Governorate	Area (Ha) Year 2002	The country level
Amran	N . A	124,683
Mareb	7,805	
Saada	6,073	
Al-Jawf	5,300	
Shabwah	1,027	
Total	20,206	

Fourth: Spring irrigation Dependable areas

Tab(4) shows the arrangement of the governorates in respect.

(Tab-4)

Year 2002

Governorate	Area (Ha)	The country level
Amran	N . A	45,339
Mareb	3,165	
Saada	2,209	
Al-Jawf	1,927	
Shabwah	373	
Total	7,674	

1. Crop Production

As previously mentioned we are going to describe the situation of crop production, reflecting and measuring each of the area and the production, and at crops groups in each governorate.

1.2. Cereal group

Regarding the area captured and quantity produced by each governorate. Concerning this indicator (Tab 5) and (Tab 6) give full description regarding the area captured and production by each governorate, its scale range within the five governorates:

(Tab-5)**Year 2002**

Governorate	Area (Ha)	The country level
Mareb	51,266	593,063
Amran	48,650	
Al- Jawf	28,253	
Saada	23,493	
Shabwah	2,438	
Total	154,100	

(Tab-6)**Year 2002**

Governorate	Production (Ton)	At the country level
Amran	N,A	559,760
Mareb	54,985	
Al- Jawf	46,802	
Saada	23,138	
Shabwah	2,674	
Total	127,499	

From Tab (6), the five governorates produced together about (127,499) ton of cereal group, which represents about (22.7%) of the total production of the Cereal produce in the country, the five governorates, they arrange as follows:

First came- Mareb Governorate with total production (54,985) ton, second arranged Al-Jawf Governorate with (46,802) ton, third come Saada Governorate with (23,138) ton, last come Shabwah Governorate with area of (2,674) ton. (For Amran Governorate the data is included within Sanaa Governorate).

In connection of the area possessed by each governorate, they arranged as following

Tab (5)

Governorate	Area (Ha)	The country level
Mareb	51,266	593,063
Amran	48,650	
Al- Jawf	28,253	
Saada	23,493	
Shabwah	2,438	
Total	154,100	

First came Mareb Governorate with total cereal area (51,266) ha, second Amran Governorate with (48,650) ha, third, Al-Jawf Governorate with (28,253) ha , fourth come Saada Governorate with (23,493) ha, and last Shabwah Governorate with an area of (2,438) ha.

The total Cereal group area captured by the above mentioned governorates is about (154,100) ha, or represent 25.4% of the country cereal crop group area which is (593,063) ha.

1.3 Vegetables area and production

Regarding the area captured and quantity produced by each governorate. Concerning this indicator, the five governorates captured about (10974) ha with total production about (81614) ton, which represents about respectively 15.7% and 9.9% relating to the total area and production of the vegetables in the country, respectively, which is (69621) (Ha) and (81895) ton. (Tab7) shows the above mentioned relationship.

Tab (7) for year (2002)

Governorate	Area (Ha)	Production	The country level	
			Area (Ha)	Prod(ton)
Amran	3,226	N.A	69,621	818,951
Al-Jawf	3,107	3,0350		
Shabwa	1,702	18,758		
Mareb	1,577	17,467		
Saada	1,362	15,039		
Total	10,974	81,614		

The governorates in regard the area and the production of vegetables arranged as following:

- First (without the production in Amran Governorate) came AL-Jawf with total area and production (3107) ha and (30,350) ton respectively.
- Second come Shabwa Governorate with (1,702) ha and production of (18,758) ton,.
- Third come Mareb with an area of (1,577) ha and production (17,467) ton.
- In the fourth place come Saada Governorate with area of (1,362) Ha and production of (15,039) ton.

1.4. Concerning the situation of the area and production of fruit group

Concerning this indicator the five governorates captured about (24339) ha with total production about (230,228) ton, which represent respectively 25,1% and 31,9 % relating to the total area and production of the Fruits in the country, which is (97056) (Ha) and (719701) ton respectively. Tab (8) shows the above mentioned relationship

Tab (8) for year (2002)

Governorate	Area (Ha)	Prod	The country level	
			Area (Ha)	Prod(ton)
Mareb	11,499	139,256	97,056	719,701
Saada	8,442	67,597		
Al-Jawf	2674	20,227		
Amran	1286	N.A		
Shabwah	438	3,148		
Total	24339	230,228		

The governorates in regard the area and the production of vegetables arranges as following;

- First (without the production in Amran Governorate) came Mareb with total area and production (11,499) ha and (139,256) ton respectively.
- Second come Saada Governorate with (8442) ha and production of (67,597) ton,.
- Third come Al- Jawf with an area of (1286) ha and production (20,227) ton.

- Fourth come Shabwah Governorate with area of 438 Ha and production of (3148) ton.

1.5 The area and the production of pulses group

The five governorates captured 15,9 % of the total cultivated area in the country, which is (49617) Ha. The governorates arranges as follows:

Amran Governorate come first in regard with total area 3459 Ha, second . AL-Jawf Governorate with total area (1658) Ha, followed by Mareb Governorate with total area(1403), fourth come Saada Governorate with total area (1189), last arrange Shabwah Governorate with total area (211) Ha.

Tab (9)

for 2002

Governorate	Area (Ha)	The country level Area (Ha)
Amran	3459	49617
Al-Jawf	1658	
Mareb	1403	
Saada	1189	
Shabwah	211	
Total	7920	

1.6 The production of pulses group (the data for 2002)

The first come, as it is appear in- Tab (10), Al-Jawf Governorate with total Production 3459 (ton), second, Mareb Governorate with total area 2222 (ton), followed by Saada Governorate with total Production (2214) 189 last arrange Shabwah Governorate with total area (189) ton.

Tab (10)

Governorate	Production	The country level Prod (ton)
Al-Jawf	3948	60541
Mareb	2222	
Saada	2214	
Shabwah	189	
Amran	N.A	
Total	8573	

1.7 Concerning the situation of the area and production of cash crop

Concerning this indicator the five governorates captured about 30397 ha with total production about (19975) ton, which represent respectively 14.5% and 11.4 % relating to the total area and production of the Cash-Crop in the country, which is (209,576) (Ha) and (174,658) ton respectively. Tab (11) shows the above-mentioned relationship.

Tab (11)

for year (2002)

Governorate	Area (Ha)	Production	The country level	
			Area (Ha)	Prod(ton)
Saada	19,232	11216	209,576	174,658
Mareb	6868	5391		
AL-Jawf	2198	2308		
Shabwah	1397	1060		
Amran	802	N.A		
Total	30397	19,975		

The governorates in regard the area and the production of cash crops arrange as following:

- First (without the production in Amran Governorate) came Saada with total area and production (19,232) ha, and (11216) ton, respectively.
- Second come Mareb Governorate with (6868) ha, and production of (5391) ton.
- Third come Al- Jawf with an area of 2198 ha, and production (2308) ton.
- Fourth place come Shabwah Governorate with area of (1397) ha and production of 1060 ton.

1.8 Concerning the situation of the area and production of fodder crops

Concerning this indicator the five governorates captured about (21,463) ha with total production about (226,766) ton, which represent respectively 18.7% and 15.8 % relating to the total area and production of the Fruits in the country, which is (114,547) (ha) and (1,429,455) ton respectively. Tab (12) shows the above mentioned relationship.

1.9 Livestock production

Livestock in Yemen represent an underexploited resource with significant potential for sustained economic growth. However, as indicated in the following (table 2), the number of livestock (Sheep, Goats, Cattle and Camels) at the six governorates stood at about 1,743,339 head in the year 2001 and about 4,49,728 head in the year 2002. In fact, it shows a sharp increase of livestock number within one year only with a growth of production reached about 39%, whereas the average fodder intake of livestock per animal is dropped sharply from 130Kg to 50Kg by which it means a great need to boost the productivity of the fodder crops.

The cell production, in the other hand, shows also a sharp increase in production and productivity with a different carrying capacity of animals per hectare. (Here Additionally include and given data for **Abyan** governorate).

(Table 12). Indicates the number of livestock and cells production

Governorate Item	Unit	Marib	Al-Jawf	Amran	Sa'dah	Shabwah	Abyan
Sheep: 2001	Head	142,974	199,411	-----	190,328	288,396	405,508
2002		303,886	344,344	568,957	478,410	514,668	329,510
Goats: 2001	Head	219,217	175,878	-----	88,346	312,532	450,741
2002		429,163	220,862	395,436	343,233	694,508	502,745
Cattle: 2001	Head	17,115	7461	-----	63,276	2,263	16,087
2002		4,870	17669	44,214	77,089	2,728	12,949
Camels: 2001	Head	8,648	12,298	-----	1,149	14,047	13,760
2002		11,644	11,779	3,637	6,014	21,614	8,872
Total: 2001	Head	387,954	395,048	-----	343099	617,238	886,096
2002		749,563	594,654	1,012,244	904746	1,238,518	854,076
Carrying Cape.Of anim./ha	An./ha	115	0.2		602	404	7.2
Cells: 2001	No.	334	226	-----	503	9,129	9,537
	Kg	456	295		863	14,336	15,371
Cells: 2002	No.	6,757	1,392	20,015	13,107	241,743	103,465
	Kg	3,341	941	13,610	8,043	164,385	79,341

Sources: Agri. Statistics Year Book 2002

2. Availability and Constraints on Supportive Infrastructure

Access roads and water supplies in rural areas of the six governorates are critical for efficient agriculture, and rural electrification is important for enhancing living standards and for accessing audio-visual communications. Almost absence of research and extension as well as steep & difficult terrain and dispersed rural areas create a major constraint for the timely delivery of inputs and evacuation of produce from the rural areas at the absence of marketing system.

Adequate and accessible potable water supply is important for healthy rural populations and for avoiding wasted time in carrying (largely a woman's job). Similarly, rural electrification is important for communications as well as for conserving wood resources. However, Accelerating the Rural Infrastructure Development is the priority of the government of Yemen for three reasons:

- For standards in rural areas.
- For invoking better resource conservation; and
- For trying to discourage rural development.

The following (table 13) indicates a sample of some supportive infrastructure in the six governorates:

(Tab-13) indicates some of the supportive infrastructure in 2002 in the year 2002

Governorate Item	Unit	Marib	Al-Jawf	Amran	Sa'dah	Shabwah	Abyan
Total Roads:	Km	1,157	93	680.1	1,409	754.5	674.5
Asphalt:		600.1	79	127.3	539.5	542.5	538.7
Paved:		556.9	14	552.8	869.5	211	135.8
Distance from Sana'a:	Km	173	143	48	242	489.5	413
Research Stations	No.	1	-----	-----	-----	-----	1
Hospitals	No.	2	1	1	1	6	7
Health Centers	No.	36	13	1	39	29	42
Health Units	No.	69	42	35	74	79	105
Pharmacies & Drug Stores	No.	-----	-----	100	-----	-----	8
Agri. Cooperatives	No.	2	4	15	11	5	8
Hotels	No.	2	6	6	6	4	10
New Project:	No.	4	-----	11	3	3	4
Cost of Investment	(000) YR	532,408	-----	1,057,550	725,000	213,000	4,199,500
Total Population:							
Male	Person	241,231	461,436	1,033,264	633,872	464,390	445,379
Female		125,370	240,617	524,608	319,298	244,766	222,682
Urban		115,861	220,819	508,656	314,574	239,624	222,697
Rural		29,173	58,245	138,797	79,513	55,928	92,627
		212,058	403,191	894,467	554,359	428,462	352,752

Sources: Agri. Statistics Year Book 2002, and National Statistical Year Book 2002

In fact, the basic infrastructure in the six governorates are very weak and in order for the government to overcome the sporadic and uncoordinated actions of the pasts and to accelerate the construction of feeder roads, village water supply and rural electrification schemes, nationwide strategies are needed and efforts should continued.

The government within its adjustments and reforms should put more efforts and attention in removal of the economic constraints, the adoption of supportive production strategies and the reorganization of government services.

3. Availability of Research and Extension in the six Governorates (effectiveness, benefits & constraints (here in points 4, 5, and 6, noted some dates concerning Abyan governorate)

Research and Extension in the Eastern Plateau (Mareb, Shabwah and al-Jawf, Sa'ada and in Amran governorates) .

3.1 Brief notes and some highlights of research and extension activities

The only Research Organization providing research services in the above mentioned Governorates is the Agricultural Research and Extension Authority (AREA) through its sub-stations lo-

cated in Seiyun, Mareb and Al-Erera. The research set up in Yemen is located in major agro-ecological Zones (AEZs) namely:

Three regional Stations serve coastal AEZ: Tihama, El-Kod and Mukalla Regional Stations.

Highlands Three Regional Stations serve AEZ: Taz, Central Highlands and Al-Erera Regional Stations.

Eastern plateau AEZ is served by two Regional Stations: Seiyun and Mareb Regional Stations.

The Regional Stations have adequate number of stationed staff especially in Seiyun and Al-Erera but understaffed in Mareb.

The RSs are equipped with modest equipment for field analysis. More complicated analysis are carried out in AREA HQ or other Regional Stations.

In General Regional Stations require support in staff recruitment and support in Field and Laboratory equipment. Great need is required in both degree and on the job non-degree training of staff

Extension is organized at the governorate Level.

Mareb, al-Jawf are having two extension service organizations supported by Eastern development Authority mainly Mareb and to a lesser extent Al-Jawf.

Shabwah is a separate extension service partially supported by a Dutch development Project "TASH."

Sa'ada extension is partially supported by Northern Development Authority (NDA).

Amran extension is partially supported by NDA.

Nearly all extension organizations are suffering from insufficient funds for running costs. This is mainly due to limited recurrent costs and the termination of externally funded projects.

Extension Agencies require support in on the job training on participatory approaches, communication skills and conducting of demonstrations on a participatory basis. Support also required in issues related to modern technologies such as local irrigation techniques (drip, bubbler etc.), as well nursery practices and orchard management of citrus, date palms, deciduous fruits vegetables and mangoes.

Linkages with research stations differ from one location to another. Extension Agencies located in close proximity to Regional Stations maintain contacts on more or less regular basis. Those located far away seldom have contacts. Shortage of funds is the main reason.

The major contacts with Regional Stations are maintained annually during the annual workshop for discussing of annual reports and of both Research and extension programs. This annual exercise is

a major event for interaction between Researchers and Extension SMSs participating in the workshops. During the past eight years AREA adopted what used to be a “Rapid Impact Program” RIP.

The principle of this program is to expedite on farm testing of promising technologies and have access to farming communities to better understand farmer’s problems.

The RIP program used to be implemented jointly by researchers and extension agents in the targeted areas. Amran and Mareb and to a lesser extent Sa’ada were among the above-mentioned governorates where RIP activities used to be implemented. RIP activities in Shabwah were restricted to the coastal area and coordinated by Mukalla Station and the Extension unit in Maifa’a.

RIP activities covered a wide range of problems related to the testing of high yielding varieties of food and cash crops, crop and resource management activities such as land preparation, irrigation methods, fertilizer application, plant protection and post harvest technologies etc.

According to RIP approach meetings with farmers used to be conducted to explain the type of testing and farmers showing willingness to cooperate are selected. Testing of technologies used to be conducted under farmers managed conditions.

Three Field Days (FDs) used to be organized. During these days farmers used to be invited to testing sites to monitor progress and discuss issues to the testing of technologies.

The major field used to be organized in the stage of full maturity of the crop around this time the results are evident in the experimental plots when compared to the control. The tests were very simple. Only one or two technologies were tested and compared with the control. The following steps after RIP were supposed to be dissemination of successful technologies. AREA responsibility in dissemination used to cover costs of the first year. Subsequent years used to be the responsibility of the extension agencies. It must be noted that the RIP concept became part of the annual programs in AREA. However, the intensity of RIP declined in the recent years due to limited outputs from on station research.

The presence of AREA in Research and on farm testing of technologies is very limited in Al-Jawf because of security reasons.

The only on-farm research conducted in Sa’ada covers Integrated Production and Protection Management in Plastic House cultivation of cucumber. These activities are coordinated from Al-Erra Station located in Sana’a. Researchers travel once every two – four weeks to supervise activities in the selected sites.

It must be noted that extension agents located in Sa’ada provide valuable support in data collection and field days as well as selection of farmers and organization of farmers meetings.

The IPPM activities in Sa’ada are supported by Arabian Peninsula Regional Program and coordinated by ICARDA/AREA joint program.

3.2 Research stations

(Tab-14)

Location	Researchers	Technicians	Field Station	Labs.
Al-Erra	31	9	14 ha	One small lab
Amran (Branch)	2	2	1ha	No
Mareb	7	5	13ha	One small Lab.
Seiyn	31	32	30 ha	Soil & water Plant protection
Mukalla	9	2	No	No

Extension Agencies**

Governorates	SMSS	Extension agents	Tchncan	Vhcls	Buses	Bikes	Extn. Blocks	Extn. Cntr.	Vet. Cntr.	Womn. Cntr
Sa'ada*	6	11	2	1	-	11	1	14	2 Vans	-
Mareb	18	15	-	6	-	3	3	11	7	1
Al-Jawf	11	17	13	1	1	-	-	7	7	-
Amran*	9	36	7	3	1	14	3	18	9	1
Shabwah	8	29	-	1	-	16	5	8	-	1

(Tab-15)

There is two research organizations were established in the 1980s: the Agricultural Research Authority (ARA) in YAR (with a network of regional stations and centered in Dhamar) and the department of Research and Extension (DRE) in PDRY (with two regional stations and centered in Aden), then combined after unification in 1990 with national coordination of extension services to form AREA whose operations are controlled by a board of directors and managed by a director general, a deputy director general and three assistant deputy directors and regional directors at each station.

As indicated from (table 15), in general, research and extension activities are absent in this governorate except Marib and Abyan that have research stations as regional stations in this two regional zones (Marib and Al-qawd research stations respectively), but are not operate well due to some constraints. The research programs have tended to be overambitious and fragmented, preventing adequate in-depth focus on priority topics. Insufficient liaison with Rural Development Authorities (RDAs) has slowed transfer of information and technologies to farmers. Linkages between research and farmers have varied. However, the system of direct liaison, developed through experienced personnel assigned full time, as research-extension coordinators are commendable.

The impact of extension system is constrained by lack of coordinated national approach, the limited number of farmers being reached, low accountability, poor quality of communications, and inadequate operating funds, all of which have affected impact and cost-effectiveness. Problems are centered on:

- Unclear objectives due to: Insufficient knowledge of target farmers; ineffective programs for women farmers; inconsistent themes of changing farming practices; weak organization, monitoring and reporting; supply-driven training programs that neglect skill gaps among staff and uncoordinated radio and television programs.
- Lack of accountability due to: Failure to match extension messages to farmers' needs; limited applicability of demonstrations; biased contact farmer selection; neglect of natural resources.

4. Sources, Availability, and Constraints of Finance for Small Farmers and Women

There are about four to five lines (sources) of providing farmers with their needs of credit (and socially not for women) such as the Cooperative and Agriculture Credit Bank (CACB), the Agriculture and Fisheries Production Promotion Fund (AFFPPF), the Social Safety Net Program, and the Commercial Banks.

The CACB is a part of the Ministry of Agriculture and Irrigation (MAI) and has Headquarter in Sana'a and offices in the main regional centers. It was established in 1973 and being the main institution for providing formal credit to farmers. It performs all banking services for Agriculture and Fisheries Production by given credit to almost all production and infrastructure needs as for the promotion of sustainable development of the Agriculture sector. In fact, it has double roles: first, it is the official vehicle for intervention in rural financial markets for making capital transfers to stimulate agriculture sector growth (but it performs quite poorly), and second, it is a financial institution which should maximize recovery of funds (but has not functioned as an effective intermediary, and for most of its life, it operates rather as a conduit for subsidies-predominantly to more progressive farmers, and appears clearly from the two tables that have been collected from the officials of (CACB).

A part the lately established safety net with its projects and funds, the AFFPPF was established to give assistance to agriculture and fisheries sectors in financing production and related activities in terms of soft loans, credits, facilities and partial of full grants, whereas, its activities appeared clearly at the six governorates as from the summary report that has been collected previously. A similar operation is the Social Development Fund, which was established to support the development of social services, particularly in rural areas.

5. Major Program Opportunities in the Six Governorates

The Republic of Yemen (not only the six governorates) has many characteristics of poor country, particularly in social indicators like health and education. Added to that, over employment has grown over the last decade and according to that, the improvement of regional development planning process, and the balance distribution of the development between the different governorates (especially these six governorates) are the core of government interests and preoccupations due to some problems, shortages that facing this special governorates and the serious need for their development especially for the rural areas. However, as it was indicated from our last visit to some of these six governorates, poverty is a widespread and affecting more than half of the population

(more than 80% of the poor live in rural areas), and the poor's expenditures are below socially acceptable norms.

From the above mentioned situation, private and public sector initiatives are needed to promote employment opportunities in rural areas of these six governorates as a way of stemming the rural-urban exodus, while agro-industries and small & macro-enterprises can provide the example of opportunities especially for women at rural areas in order to achieve an increase of sustainable development in these governorates.

The major program opportunities that would help in the development of these six governorates can be summarized in the following important points:

- Assist the government in creating a Rural Development Authority, or a Regional Development Program at the southern agro-ecological region that will cover Shabwah and Abyan governorates for providing extension, training and other services, as well as helping small-scale farmers to improve their productivity, income-earning potential and increase employment/income generation opportunities in agriculture and all other connected services.
- There is a need for strengthening the Research and Extension stations at Al-Quad station (Abyan Gov) and Marib station to be more effective for the benefit of the farmers and the development of the two governorates in the region.
- There is a need for creating a program focusing in livestock production and targeting the small-scale and farmers by providing them with a small No. of Sheep & Goats (5 – 10 head) or (20 – 30 chicken), and aiming to support their difficult livelihood as well as increase livestock production at the rural areas of the six governorates.
- Since the Agricultural Extension is very weak and inactive especially at the rural areas, creating a special program for Agri. Extension at rural areas (namely Special Program for Rural Extension) is very essential for the six governorates. This program could be centered at Sana'a and has six well equipped units in the six governorates that will be operated by partly support at the beginning from the donor (90%) and (10%) from the government, then increase the contribution of the government contribution gradually by (10- 15% per year) until will be fully operated by the government at the end of the donor's support.
- There is a need for establishing a Special Program for increasing awareness of farmers of tree cultivation for their productive function as well as for conservation promotion and prevention of sand movement to prevent desertification.
- Since (almost) all the six governorates have water scarcity (especially Sa'dah governorate, which has a serious situation, it is important to find out a solution for this serious issue and create a program focusing on recharging the underground water of the governorates' aquifers, and introducing new technologies for modern irrigation system to improve efficiency of water used in irrigation in all governorates.
- There is a need for activating the existing marketing centers like the one in Marib governorate and establishing new marketing centers in the other governorates to facilitate selling farmer's production and other outputs.

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**Annex 9:
Trade Policy and Agriculture**

Annex 9. TRADE POLICY AND AGRICULTURE

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Introduction

This chapter focuses succinctly on a series of inter-related issues in the domain of trade policy and practice that will be of both immediate and long-term concern to USAID. Each issue discussed was raised during the course of the Team's investigations, and every one of them carries potential to affect—positively or negatively—USAID's activities in agriculture as well as in other sectors. Therefore, where no direct action is proposed, awareness becomes paramount.

The chapter, of a somewhat diverse nature from the others of the report, adheres to the following format: articulation of the issue, brief elaboration of its meaning, bearing on USAID programming in agriculture, and relevant suggestions for action or follow-up. The parameters of relevance are determined by the anticipated program and activity design requirements of USAID in the agriculture sector: while observations may be of interest to the Government of Yemen, they are not specifically directed towards it.

Yemen is taking meaningful steps towards the creation of a modern, liberal policy environment for trade and for foreign direct investment. These steps are salient in the investment law, certain amendments to the foreign trade law, in the foreign exchange regime, the tariff structure, and in Yemen's initiatives towards membership in regional trade agreements (RTAs) and accession to the WTO. The discussions that follow should be viewed in the context of these many progressive measures; criticisms of one or another issue do not constitute denigrations of the country's overall enlightened move towards the future.

International Agreements

Yemen is in the process of accession to the WTO and of membership in the Greater Arab Free Trade Area (GAFTA), and the Gulf Cooperation Council (GCC).

For the WTO, Yemen is actively preparing its response to Geneva's commentaries on its trade memorandum (MFTR). Yemen is participating in some of the GCC committees, including agriculture¹ and is adopting most GCC norms and standards. Yemen joined GAFTA in 2003, will begin implementation in 2005.²

For political, security, social, and economic reasons, Yemen's integration into the international community of nations will bring measurable benefit to its people, to the region, and to the world at large. The country's initiatives in this arena are in conformity with the U.S. Administration's explicit objectives for the region, as well as with A.I.D.'s strategy of building trade capacity in the developing world. While Yemen's multilateral trade engagements may have a greater posi-

¹Yemen joined four GCC bodies (sports, education, labor, and health) in 2002; it joined the Agriculture Council in December 2003 (See the "World Economic Update", Winter 2003, p.2). The GCC members have decided to form a customs union with a single five percent external tariff.

²Information on GAFTA provided in interview with the chairman of the WTO accession office in the MOIT. There is conflicting information about Yemen and GAFTA which the present study cannot clarify.

tive impact on agriculture and economic growth in Yemen than any donor program or internal initiative, adherence to international standards will require sometimes-difficult adjustments.

For both political and economic reasons—some well founded, others groundless—various sectors will oppose aspects of liberalization or the general direction of internationalization. As the economic justification for trade liberalization rests on broad increase in welfare, the Government of Yemen will need the technical assistance and economic and political support of its donor partners to make and enforce appropriate decisions.

Recommendation: *All partners in the agriculture sector, including USAID, should be involved in national trade policy development and in both the WTO accession process and Yemen’s integration into the RTAs.*³

The World Bank’s PRSP places emphasis on the mainstreaming of trade in Yemen’s economic development. Although other donors are taking the lead in providing trade-related assistance through the Integrated Framework (IF), changes to tariff rates, sanitary and phytosanitary (SPS) regulations, import procedures, technical barriers to trade (TBTs), allowed subsidies, and so forth will directly—often immediately—affect domestic agriculture as well as other sectors. For these reasons, and because USAID enjoys the respect of a major partner for Yemen, the Mission should have a place in IF roundtables and should become a partner of the MOIT.

Informal Trade and Its Causes

Unregistered, cross-border trade is vast and traditional but counterproductive in the long run for Yemen.

The imports from Djibouti and the exports to Saudi Arabia follow historic patterns and are probably sufficiently voluminous that they would cause a marked difference to agriculture’s contribution to GDP if entered into the national accounts. The Central Statistical Office shows zero exports of livestock from Yemen for 2002, yet the transport of bovine cattle to Saudi Arabia from Yemen is a well-known practice in the marketplace.

However consecrated by tradition and tolerated by authorities, informal cross-border trade⁴ is undesirable from several compelling points of view:

- It allows for the contraband of illegal or non-Islamic goods.
- It permits introduction into Yemen of contaminated, harmful, or expired merchandise.
- It results in a loss of fiscal revenues to the government.
- It leads, in the export phase, to a negative image of Yemeni products.
- It subverts quality control and improvement.

With the exception of the first point, every one of the consequences listed above has direct implications for the agriculture sector, especially in the governorates identified as priority for

³“Building capacity across ministries for assessing trade policy” is a recommendation of the World Bank. (*Diagnostic Trade Integration Study*, p. xii.)

⁴“Smuggling” and informal cross-border trade are frequently used synonymously. Smuggling, however, bears unsavory connotations of criminal activity. While such activity exists in the Yemeni context, much or most of the trade referred to in this context is of legitimate product and is carried forth openly.

USAID. One of the principal remedial actions proposed in this report—technical assistance to improve packaging, quality, and even data access—will be compromised by the attractiveness of illegitimate, or at least informal, export.⁵

Recommendations: *Analyze closely the disincentives to formal trading. The analyses should include information (e.g. in the Marib or Sa’ada governorates) on the volumes, mechanisms, products, and price differentials in informal trade of agricultural products, including inputs.*

As with all shadow, or informal, commerce, economic choices lie just beneath the surface. The disincentives to formal trade can emerge from several quarters. They may reside in an unreasonable policy or regulatory environment, in corruption and harassment, in lack of enforcement, and in the acceptability of product in the buyer’s market. In Yemen, all sources contribute at one time or another.

No single measure will significantly diminish informal import and export in Yemen. Confrontation with draconian enforcement measures would prove counterproductive on every front. The enabling environment for trade must become such that it makes better economic sense to conduct activities in the full light of the law than to conceal them from the authorities. Raising the quality and acceptability of agricultural exports is one painstaking but sure avenue to the increased formalization of trade in agricultural goods.

Since the causes leading to preference for informal trade are multiple, the means to address the matter must also be various. Many of the issues and suggestions for action that follow below directly concern informal trade.

Yemeni overland exporters of agricultural products suffer periodic obstruction from the Saudis. The main reason for the blockages is alleged to be concerns over food safety. Individual traders also levy accusations of capricious and unjust imposition of standards (i.e., unwarranted TBTs).

In respect of the accusations of unfair trade, it is likely in some instances that the Saudis enforce their regulations with enhanced severity for non-technical reasons. There is a bilateral history of resorting to trade discrimination for reasons alien to sanitary, environmental, or economic factors. Fortunately, evidence suggests that these incidents are diminishing and—barring deterioration in the political climate between the two countries—will eventually disappear.

In respect of the food safety concerns, however, Yemeni food and livestock exports are known to contain high levels of toxicity and potential for transmission of disease.⁶ Domestic quality control of exports is deficient. A vicious circle occurs in which traders resort to informal routes in order to sell the products, and the success of their efforts diminishes incentives to attack the problem at its source. The result is stagnation in quality of product from the small farmers, and in quality control from wholesalers and merchants. This situation is especially severe among the poorest farmers in the governorates that USAID is targeting for assistance.

⁵The World Bank (*Diagnostic Study*) also recognizes that smuggling “is not an efficient way of conducting trade.”

⁶See the FAO project paper, “Strengthening The Food Control System.”

Recommendation: *Through a study tour or a technical consultancy, explore the motives from the Saudi side—especially the Saudi regulations on food safety but also Saudi customary import sources for the products in question.*

Yemen has inadequate control over food safety. Lack of harmonized, consistent legislation and the diffusion of responsibility through several agencies have all but paralyzed constructive efforts to remedy the situation. The disciplines of the GCC countries in this area cause Yemeni exporters to avoid formal trade.

No single authority in Yemen controls food safety.⁷ Standards used follow a priority order: national, GCC, and Codex Alimentarius, with national regulations—where they exist—in first priority. But the infrastructure and human resource to implement inspection and control are reputed to be severely inadequate. The situation on the export side is even more serious, since food-safety concerns gather primarily around imported goods. The GCC countries—and especially Saudi Arabia—have strict regulations on imports and the ability to enforce them. This often causes the small Yemeni trader in agricultural products to avoid formal export routes, with consequent loss of revenue to the poor farmer.

Complicating Yemen's situation in this regard is the fact that it is radically different in wealth and food needs from all six of its neighbors and trading partners in the GCC, which absorb 90 percent of its exports to the MENA countries and most of its non-fish food exports. As countries with high GDP/capita ratios and which import almost the totality of their food, the Gulf States typically impose food safety standards equivalent to those of the OECD countries. This means that while Yemen will benefit greatly from adoption of *most* food safety standards of the GCC, it is not yet ready for all of them in a single package.⁸

Recommendation: *Make quality control a focal point of technical assistance and extension, even in small, local projects.*

Much donor-coordinated work is already planned at the national level. The FAO will provide technical assistance with primary objectives of reorganizing the food control system and establishing a Codex Committee. Yemen's initiatives with the RTAs and, especially, the WTO, are exposing it to the realities of the SPS and TBT agreements. USAID should follow the initiatives and implement pilot activities in one or more governorates. In the design of technical assistance, it will be important to understand the issues as well as the interventions of the donors. As food contamination bears a relationship to informal trade and smuggling, USAID's efforts to bring exports (and imports) into the formal system will contribute to amelioration of the problem.

Despite the abolition of the import license, traders are required to obtain an import permit for many agricultural products, and there are seemingly unwritten export bans on others.

⁷The Standardization and Metrology Organization, the Directorate for Environmental Health, the Central Health Laboratory, and the Agriculture Quarantine Department are all involved without central coordination.

⁸The Saudis, for example, have very strict regulations regarding genetically modified foods; it is highly unlikely that Yemen needs such legislation at this time or could afford to implement it.

The permit is not a back-door substitution for the previous license, which was costly and heavily bureaucratic. Issued by the concerned ministry (often the MAI), the permits are described by the MOIT as technical requirements. As such, they serve a purportedly legitimate function of ensuring that substandard or harmful goods are not introduced into the country without knowledge of authorities.

But the permits are also used to protect a foreign company's agent or exclusive representative. An importer can be refused a permit if, for example, the MAI is aware that the product he intends to procure is sold by a foreign firm that already has a registered agent in Yemen.⁹

This second function of the permit is of questionable usefulness: Agency and commercial representation should not normally be the objects of either competition law or trade policy. Furthermore, the refusal of permits leads directly to smuggling of the goods solicited with the consequent loss of any responsible oversight and fiscal revenue. A corollary result leads to the presence in the market of expired, noxious, or otherwise harmful substances unaccompanied by any form of extension or control.

The first function—that of controlling commonly used but potentially hazardous products such as pesticides—is probably ineffective, given the porosity of Yemen's borders.

Recommendations: *In collaboration with the MAI, conduct a study of the permit process that includes:*

- Evaluation of the efficiency and effectiveness of controlling products through use of the permits;
- Determination if the permits are being used in ways that distort domestic commerce;
- Commentary on the likelihood that the permits could end up as TBTs.

One of the first steps in such a study—and it could be a wholly independent, preliminary step—is to compile a list, in collaboration with the MAI, of products requiring an import permit.

Tariffs and Customs

There is an effective, and not entirely transparent, duty of 35 percent on certain horticultural products.

Yemen's four-band tariff structure is simple and transparent, but other taxes can increase the cost of imports. Although Yemen's maximum tariff rate is 25 percent, various horticultural products are assessed an additional import tax of 10 percent, raising the effective duty to 35 percent.

WTO issues of tariffication aside,¹⁰ the effective rate is of obvious interest to USAID and other donors that support the small farmers who produce these products. Thirty-five percent is a substantial effective tariff explicitly designed for protection of a target group of farmers. According

⁹Exclusive agency laws are common in the Arab countries and constitute one of many typical unnecessary or obtrusive legislative details that raise the cost of doing business without conferring benefits. See Hoekman, *Harnessing Trade*, p.13.

¹⁰In the multilateral trading system, tariffication refers to the conversion of concealed, non-tariff measures to transparent tariffs.

to official respondents, the GoY hopes the WTO accepts this rate as a bound tariff. Such acceptance—either by the WTO or by either of the RTAs—is at this point uncertain. Even the calculations leading to the rate are crude at best. The best rate could even be higher.¹¹

Recommendations: *USAID should verify with the MOIT and the MAI that a responsible study is being conducted on this issue. USAID should remain attentive to consistency and transparency in the way the GoY treats fiscal matters.*

Ample funds are available for exactly such studies (see the chapter on donor assistance). Rather than take a position for or against the protection, USAID should push for the study and, if possible, request an early review of the terms of reference to ensure neutrality of research.

Adding taxes to customs duties can diminish merchants' and investors' confidence in the stability of the trade regime. Such measures should be taken, even at this stage, in compliance with WTO rules and international good practice. Sound studies, with publicly published result, form the best defense against accusations of unreasonable discrimination and concealment.

Customs has improved greatly in recent years, but training, enforcement, and a move to transaction valuation—especially in the northern border—will facilitate trade and lead to its increased formalization.¹²

Anecdotal information indicates considerable differences in the efficiency, probity, and modernity of customs operations at different ports. Road ports are generally considered the worst. Traders complain of sluggish clearances, the necessity of side contributions to agents, and—to a lesser degree—of arbitrary valuation.

Recommendations: *Have an expert consultant assess trade facilitation, including valuation and clearance, at a land port such as Harad, of interest to traders from USAID's target population.*

Know and support other donor and GoY efforts to harmonize customs procedures at all ports.

Market and Trade Data

Product price information in regional export markets appears to be controlled by commercial intermediaries. Small producers are the losers in such a system.

With the advent of mobile telephones, even small traders across the world enjoy nearly immediate access to market price information. But price data is rarely straightforward: on the buyer's side it fluctuates with volume and quality, on the trader's with cost of receiving, loading, and transporting. If normal commercial wisdom dictates raising the selling and lowering the buying costs, customary practice often involves deceiving the seller. The ARD Team listened to numer-

¹¹The FAO in 2000 produced a series of studies on the implications of the GATT for Yemen. These include analysis of the impact of the Agreement on Agriculture and concluded that joining the WTO would probably open markets for Yemeni fruit and vegetable exports. (*Implications of the Uruguay Round*, p. 9)

¹²Yemen still uses the Brussels valuation system. The WTO and the World Customs Organization strongly recommend using transactional valuation, i.e., applying the respective duty *ad valorem* to the declared price on the invoice. Transactional valuation is more efficient, less arbitrary, and curbs bribery.

ous cases revealing such practice—especially in the overland export of agricultural produce to Saudi Arabia.

Recommendation: *Establish a pilot activity to bring market information directly to producers.*

Market information must include current prices, historic price trends, demand trends, and future price and demand predictions. USAID could establish an independent activity or incorporate this service into a more encompassing project. It may prove of interest to study the CILSS work in the Sahel region. While CILSS is a multilateral organization and probably an overgrown bureaucracy, it attends to a drought-plagued region embracing similar peoples with common languages, and it has had some notable successes.

**Annex 10:
Project Proposal Outline, RWDGD**

Annex 10. Project Proposal Outline, Rural Women Development General Directorate.

04/05/04

1. The Rural Women Development General Directorate (RWDGD)

1.1 A brief history

As early as 1986 the Ministry of Agriculture and Irrigation (MAI) installed the Rural Women Development Directorate (RWDD) to further the attention for gender issues in the ministry. RWDD started in Sana'a, with a staff of 3 and, in fact, limited room to manoeuvre. In 1999 RWDD was upgraded to RWDGD to allow the director to participate in policy meetings in order to signal the relevance of gender specific actions at the appropriate levels. A second phase of the Netherlands support (2000-2003) ended in April 2003. It was followed by an extension till the end of 2003 after which Netherlands assistance will stop.

The first phase of the Netherlands assistance to the RWDD started in 1996. The Netherlands assistance comprised of capital investments and technical assistance. Much attention was paid to institution building, human resource development, upgrading offices and improving operational facilities.

By now, RWDGD had opened field offices (RWDD's) in almost all the governorates of the country. RWDGD and RWDD have trained staff in all offices and the refurbishing of the office facilities in the various governorates is well under way. For an overview of the achievements see the table on p. 7.

The strengths of RWDGD can be summarised as:

- Well embedded in GOY and supported by government (see the Organogram on p. 8).
- A presence in majority of the governorates.
- Availability of gender sensitive trained staff at the national and local level.

1.2. Mandate of the RWDGD

Working from within the MAI the RWDGD has been given the mandate to, and is responsible for: "Promoting Gender sensitive agricultural policies, strategies, programs and projects that are conducive at attaining sustainable agricultural development and food security"

RWDGD can operate inside and outside the MAI as long as it aims at rural women.

1.3 The strategies followed

To fulfil its mandate the RWDGD has adopted the following set of strategies and lines of action:

1.3.1 In the field of policy development

- Participate in preparing the policies and strategies of MAI with regards to the economic role of the rural women in the agricultural sector
- Participate in preparing the policies and strategies of the concerned General Directorates to guarantee support of the economic role of women.
- Setting priorities according to the needs of the geographical areas and present them to the authorities concerned.

1.3.2 In the field of project and program planning and execution

- Participate in planning programs and projects of developing the rural women: executed by the sections concerned with rural women and associations and according to the policy and strategy of the ministry.
- Monitoring and evaluation of plans and programs of the sections of RWD through the offices of the MAI to guarantee the execution and strategy of the ministry.
- Finding marketing channels for the products of rural women through co-ordination with the partners concerned,
- Studying and following up the problems and obstacles in the field and discussing these with the concerned authorities in the ministry to find a suitable solution.

1.3.3 In the field of coordination and cooperation

- To have contacts with the authorities concerned with the development of rural women and working amongst the focal point of the donors and international organisations.
- Coordination and co-operation with the concerned authorities (govt, ngo's and int'l org.) to obtain the support for the programs and projects for the development of rural women.
- Coordinate with the general authorities for research and extension, for training and the preparation of cadres and setting the priorities for research in relation with the programs of the development of rural women.

2. Potential Cooperation with USAID

USAID are in the process of formulating project activities in 5 governorates, Aljawf, Amran, Mareb, Saada and Shabwah. The intended target group is the rural population, including a specific emphasis on women,

In view of its mandate as well as its established strengths and presence in most of these governorates, co-operation between USAID and the RWDGD seems to be a logical step.

RWDGD would be able to help establish activities that:

- Can be started in a relatively short time,
- Need little time to show tangible benefits for the target population.
- Would alleviate the burden in the daily lives of the rural women in Yemen, and
- Provide additional gender specific information on agriculture (and other fields) to the rural areas.

3 Proposed Project

RWDGD have drafted the following outline for a project proposal aiming at improving the living and working conditions of rural women in Yemen.

3.1 Justification for the present proposal

Women are the main stay in (subsistence) agriculture, accounting for 60% of the crop-labour and 90 % of the labour in livestock. They also bear the brunt of all household tasks, childcare and family care. Every day they spend hours, collecting water, fuel wood and fodder for the animals that are also their responsibility. These tasks are not only long; they are often very heavy, as the only means of transport is in many cases the women's back.

To allow women to improve their situation the first thing that has to be done is to reduce their workload. That is why the RWDGD is giving high priority to providing the less fortunate with devices and tools that will make their tasks lighter and shorter. Once that is realised we

can hope to assist them with educating them selves and engaging in more income generating activities.

3.2 The target group

To get some idea of the possible magnitude of the project and the size of the target group, Table 1 presents some population figures (after the statistical yearbook) for the 5 governorates.

Table 1

Governorate	Total Population	Rural Population
Mareb	241.200	212.000
Al-Jawf	461.400	403.200
Saadah	633.900	554.400
Amran	1,033.300	894.500
Shabwah	484.400	428.500
Total	2.854.200	2.492.600

From the table it can be seen that more than 80 % of the population in these governorates lives in the rural areas. As the average household in the rural areas has about 7.5 members there are about 380.000 families in the 5 governorates together. To address this entire target group would require very large sums of money and a long period of time. Therefore, to narrow down the target group the following is proposed: In many rural families the husbands are migrant labourers. In their absence the women are responsible for all economic activities. It is proposed that the project aims specifically at these families.

Based on the assumption that in about 50% of the families the husband is absent, and assuming the project must reach 10% of these (i.e. 5% of the total number of households) to have any noticeable impact, the number of families to reach will still be 19.000. This is about 3000 families per governorate. It is understood that the project duration foreseen by USAID is three years. This means that the average number of families to be reached by the project in each governorate is 1000 per year. This is still a formidable number and the first project year will learn if it is realistic in view of the implementation capacity in the areas.

To decide which of the families would merit assistance from the project, RWDGD will set up a mechanism for decision making at the local (village) level in which women have the main say. This mechanism will result in a commonly agreed upon ranking of the eligible families in each village.

3.3 Project activities

In the course of 2002 RWDGD commissioned a study on “Time and Labour Saving Devices for Rural Women”. The study took place in the rural areas of Dahmar, Lahej, Abyan, Taiz and Mahweet. This study identifies a number of problems women in the rural areas are facing on a daily basis and indicates a number of possible solutions. Table 2 presents a summary of the findings of study.

Table 2. Summary chores of rural women, problems and solutions

The Daily Chores of Rural Women	The Problems	Possible Solutions Depending on the Area	Available in Yemen	Roughly Estimated cost per unit
Fetching water 1)	Long distances (time) Heavy transport	Rainwater harvesting from roofs	Yes	70.000 YR
Forage collection 1)	Bad tools for cutting Heavy transport (time)	Improved tools	Yes	3.600 YR/fam
Hand feeding dairy cows	Cows will not eat dry sorghum stalk. They have to be wrapped in alfalfa and hand fed to the cows.	Chopping of fodder by means of a chaff cutter Feeding troughs. And using bone ash.	? (India) yes	
Watering farm animals 1)	Long distances (time) Heavy transport	Dig water tanks 2) Roofing animal sheds	Yes Yes	
Milking 1)	Uncomfortable position Unhealthy surroundings Little milk	Raised platform Fixings for goats Ventilating stables More water for the animals	Yes	1000 YR
Churning milk	Time consuming (1 hour daily)	Electric milk churner, using trad. Gourd Hand milk churner, using trad. Gourd	yes	10.000 YR
Providing fuel	Long distance (time) Difficult cutting/uprooting Heavy transport	Bio gas plants 2)	Yes	75.000 YR
Poultry keeping 1)	Low yields and loss of chicken and eggs	Improved housing/ Incubators		10.000YR
Grinding flour	Heavy, requiring much time and energy.	No solution yet		

Based on the report: *Time- and labour saving devices for Rural Women*

- 1) Possible early implementation
- 2) Possibilities for common use (more than one family) must be considered.

The relevance of these subjects will have to be checked during a survey proposed in all the 5 governorates. Although it is very likely that some of these problems will come up, the survey will be needed because of the different climatic and geographic conditions in the 5 governorates mentioned above.

Also it must be noted that for some of the problems ready solutions exist in some areas (where there is electricity) and not in others.

3.4 A plan of action

To ensure that the final project proposal answers the needs of the rural women in the six governorates the following action plan is proposed:

Table 3 Plan of action

Activity	Responsible	Time Frame	Starting Date	Cost
Survey, a visit to each of the 5 directorates to discuss with groups of women, what their most pressing needs are.	RWDGD and RWDD	6 weeks	010304	PM
Establishing communications between field offices RWDD and head office RWDGD by intra-net	RWDGD/USAID Contractor	4 weeks	010304	usd 75.000
Based on the outcome of the survey acceptable solutions must be identified	RWDGD/RWDD USAID	2 weeks	150404	
Identify implementing organisation for construction and distribution (NGO)	RWDGD/USAID	8 weeks	010304	
Identification of suppliers, contractors, providers.	RWDGD/Impl. Organization	8 weeks	010504	
Start setting up the local systems for selection of the individual families that will benefit from the project	RWDGD/RWDD and Local organizations.	duration of the program	010504	
If needed be build prototypes	Pm	Pm	010504	
Set up an information campaign make leaflets visit all villages discuss with local authorities on the distribution system set up a monitoring and administration system Radio programmes *)	RWDGD and RWDD in 5 governorates.	duration of the program	010504	usd 330.000
- Distribution of radio's *)				usd 50/pc
Train field staff of the RWDGD in the specific solution	RWDGD		150404	
Start distribution/delivery			010804	

*) The reasons for choosing radio instead of television are:

The radios we have in mind do not need batteries but can be "hand-cranked". These can be used in areas where no electricity is available and batteries are hard to get (or too expensive)

Televisions are too expensive and need electricity. In addition, the men often decide the choice of the television programs watched.

In the final project document detailed work plans will be provided for each governorate.

3.5 Budget

A proposed budget of US\$ 6.000.000 in USAID funds would be used over a period of three years as follows:

RWDGD central administration:

- Communications -intra-net for head office RWDGD-field offices RWDD
- (This is a one-time investment.) US\$ 75.000
- Other RWDGD expenditures for three years are estimated as follows:
- Staff training and monitoring: US\$ 50.000/year 150.000
- Information campaign (5 governorates): USD 110.000 per year 330.000
- Total RWDGD over the project period US\$ 555.000

Funds to improved technologies to benefit families, with specific emphasis on items (Table 2 above) that are of direct assistance to women US\$ 5.445.000

Total budget US\$ 6.000.000

The US\$ 5.445.000 funding for improved technologies for the 19.000 families is based on an average of about US\$ 285 per family. With this amount per family more costly items like rainwater harvesting and bio gas would probably still require a substantial contribution from the beneficiaries, or alternatively they would have to serve many families.

3.6 The project modalities

- The role of the RWDGD

The role of the RWDGD's will be that of awareness raiser, trainer and information provider.

It will also organise and supervise the process of selection of the beneficiaries at village level.

RWDGD will also decide with local organizations on the level of contribution of the beneficiaries. For RWDGD this may mean that additional training of its office staff will be needed. Most of all practical project oriented training. This training should not be limited to the agricultural components of the interventions but may also address related health and environmental issues.

- Role of NGOs

A co-operation will be forged with one of more organisations (NGO's) that can manage (supervise) contracts with suppliers and monitor the actual implementation of the activities (construction, distribution of tools).

- Role of local population

In the implementation of the project, local manpower available in the governorates must be mobilised as much as possible. Therefore it must be considered to encourage (or set up) local enterprises that assist in the implementation of the project, thus creating jobs and income in the areas. In that way repairs and maintenance can be taken care of at the local level, thus assuring sustainability.

Overview of RWDD and RWDD offices, personnel, and activities

No	Locations of RWDD	Office Rehabil.	No staff	Training and studies (see below)
1	Women section – forestry	no	1	
2	Haraz (Women Directorate N.A.)	planned	3	2,4,6,
*3	Amran (Women Directorate N. A.)	planned	4	1,2,S4,
*4	Mareb Governorate	completed	9	1,2,4,6,
5	Al-Mahweet governorate	completed	7	1,2,3,4,6,7,8,S1
6	Al-Hodeidah Governorate Tehama Bagel centre Zabeed centre Mowor centre	completed	7 20 19 20	1,2,4,6,S4
7	Taiz Governorate	completed	6	1,2,3,4,7,8,S1,S4,S5
8	Ibb Governorate	completed	5	1,2,3,4,5,6,8,S4,S5
9	Dhamar Governorate	planned	5	1,2,4,6,S1,S4,S5
10	Aden Governorate	completed	3	1,2,3,4,5,6,7,S4
11	Laheg Governorate	completed	9	1,3,4,5,6,8,S1,S4,S5
12	Abyan Governorate	completed	12	1,2,3,4,5,6,8,S1,S4,
*13	Shabwa Governorate	completed	5	1,3,7,S4,S5
14	Sayun	completed	2	1,2,3,6,7,S2,S4,S5
15	Socotra	planned	2	Programmes by France
16	Al – Baida Governorate	no		1,
17	Al- Mahrah Governorate	planned	2	1,2,4,6,
18	Al- Dalah	planned	2	1,4,
*19	Al- Jawf Governorate	planned	1	
20	Haja Governorate	no		
21	Al- Mukallah	planned	1	7,
*22	Saada Governorate	planned		
23	Sana'a	completed	9	1,3,4,5,6,

* Governorates targeted by USAID

The numbers indicated in the column training activities refer to the following:

- Training

1. Gender in Agriculture and food security
2. Advocacy lobbying networking and communications
3. Gender sensitive monitoring and evaluation
4. Gender sensitive management and program planning
5. Gender concepts, planning cycle and M&E (for ext. agency)
6. Strategic planning for gender policy on agriculture and food security
7. Capacity building gender sensitive PRA, theory and practice
8. Data collection & analyses

- Studies

- S1 Mapping exercise time and labour saving devices
- S2 Study rural women needs in co-operative of La Soum/Sayun
- S3 Study preparations data collection on Marketing rural products
- S4 Study on animal production in Yemen
- S5 Study on post harvest technologies

Organogram
Ministry of Agriculture and Irrigation

